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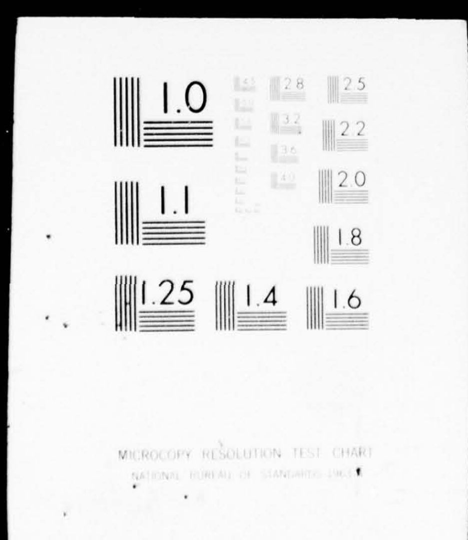

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SUPERSONIC JET EXHAUST NOISE INVESTIGATION

Volume III
COMPUTER USERS MANUAL FOR AEROACOUSTIC PREDICTIONS

GENERAL ELECTRIC COMPANY
AIRCRAFT ENGINE GROUP
ADVANCED ENGRG. AND TECH. PROGRAMS DEPT.
CINCINNATI, OHIO 45215

JULY 1976

TECHNICAL REPORT AFAPL-TR-76-68
FINAL REPORT FOR THE PERIOD 1 DECEMBER 1972 - 23 SEPTEMBER 1975

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AIR FORCE AERO PROPULSION LABORATORY
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433
and
DEPARTMENT OF TRANSPORTATION
OFFICE OF NOISE ABATEMENT
WASHINGTON, D.C.

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This technical report has been reviewed and is approved for publication.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report gives a detailed description of aerodynamic (Shock-free/Shocked flow) and acoustic turbulent mixing computer prediction programs developed by the General Electric Company for subsonic and supersonic simple exhaust jets. In addition to giving detailed descriptions of the aeroacoustic formulations and discussions of computer manual instructions for operating the program, extensive theory/data comparisons are given, as well as computer program listings and sample test cases.

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FOREWORD

This is Volume III, The Computer Users Manual, of the final Technical Report prepared by the Advanced Engineering and Technology Programs Department, Aircraft Engine Group of the General Electric Company, Evendale, Ohio under the joint sponsorship of the Air Force Aero-Propulsion Laboratory, Wright-Patterson Air Force Base, Ohio and the Department of Transportation, Washington, D.C. under Contract F33615-73-C-2031. The inclusive dates for this work were December 1972 through August 1975. The work was accomplished under Project 3066, Task 14, Work Unit 07, with Mr. Paul A. Shahady (AFAPL/TBC) as Project Engineer. Dr. Paul R. Knott of the General Electric Company was technically responsible for the work. Other General Electric personnel were: Mr. David R. Ferguson, Applied Computer Methods, and Mr. Michael A. Smith, Acoustic Engineer. Additionally, Drs. C. L. Merkle and C. Y. Chen contributed to the work but, are no longer at the General Electric Company.

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VOLUME III

INTRODUCTION

During the course of this Supersonic Jet Exhaust Noise Investigation, the General Electric Company has developed a number of computational aerodynamic and acoustic predictive schemes. These computational methods were developed primarily to characterize key aerodynamic and acoustic features of unheated and heated subsonic and supersonic simple circular jets. Extensive accounts of these methods have been documented earlier. Some of the key documents are AFAPL-TR-72-52, AFAPL-TR-74-25, J. of S&V 25 (1972), AIAA 73-188, Proceedings of HT&FMI (1974), as well as the results presented in Volume II of this final report. This report is a computer user's manual for the developed programs.

The overall computer system is called the "Supersonic Jet Noise Prediction System" (SSNOISE). It is composed of four programs: JETMIX - an aerodynamic program for planar and axisymmetric compressible turbulent mixing jets. It also contains options for confined jet mixing, a coannular/coplanar free jet, the influences of external flow on jet mixing, and composition of chemically inert species throughout the flowfield. SSFD - an inviscid analysis of supersonic turbulent jets including shock waves. MERGE - a collation program of the aerodynamic output of JETMIX and SSFD. NOISE - predictive schemes for turbulent mixing aerodynamic noise.

Section 1.0 contains the general program concepts and descriptions of JETMIX, SSFD, MERGE, and NOISE. Section 2.0 discusses the detailed input requirements of the Supersonic Jet Noise Prediction Programs (SSNOISE), while Section 3.0 describes the output and a sample case. Section 4.0 discusses the general operating procedures. Following Section 4.0, there is a series of appendices which are dedicated toward the mathematical analysis incorporated in SSNOISE, as well as a series of input sheets and program listings. The last enclosure is the Reference listing.

SECTION 1.0

PROGRAM DESCRIPTION

1.1 GENERAL DESCRIPTION

The Supersonic Jet Noise Prediction System (SSNOISE) provides an analytical tool for determination of the aerodynamic flow field and the associated aerodynamic noise of supersonic turbulent jets. The SSNOISE system is composed of four programs which may be either run alone or in sequence. They are:

1. JETMIX - Analysis of Free and Confined Jet Mixing
2. SSFD - Inviscid Analysis of Supersonic Turbulent Jet Including Shock Waves
3. MERGE - Collation of the Aerodynamic Output of JETMIX and SSFD
4. NOISE - Prediction of Aerodynamic Jet Noise

A functional description of each of these programs is included in the following sections. Also included is a detailed flow chart of the data flow in the system and a description of the overlay structure on the CDC 6400/6600 computers.

1.2 JETMIX

The JETMIX computer program is a general aerodynamic analysis tool for the prediction of both planar and axisymmetric compressible turbulent mixing regions. The flow field may consist of either a single free jet, a coannular/coplanar free jet, or a confined jet which is constrained to mix with a coannular flow inside a duct of varying cross-sectional area. In addition to determining the aerodynamic properties of the mixing region, the JETMIX program also traces the rate of diffusion of chemically inert species throughout the flow field.

The transport of momentum, energy, and individual species by turbulence effects is included in the analysis by means of a semiempirical turbulence model which relates the turbulent transport terms in the time-averaged equations to the amount of kinetic energy which is contained in the turbulent eddies. This turbulence kinetic energy (TKE) is calculated, in turn, from a conservation equation which keeps track of the net effect of the production of turbulence energy by the local shearing forces in the flow, as compared with the decrease of turbulence energy by dissipation into heat, by diffusion, and by the streamwise convection of the turbulence energy with the time-

averaged flow field. It is important to note that the use of the turbulence kinetic energy in the turbulence model causes the turbulent transport terms to depend not only on the local flow properties (and their gradients) but also upon the history of the flow.

This turbulence kinetic energy approach for modeling the turbulent effects is to be contrasted with the pure mixing length theories. Like the TKE approach, mixing length theories (such as G.I. Taylor's vorticity transfer theory and Van Karman's similarity hypothesis) have also yielded viable results when properly correlated with experimental data. However, the extension of these theories over a wide range of flow conditions using a single empirically determined mixing length has not proven feasible. This lack of generality is partially due to using local flow properties to determine the local viscous transport effects in a turbulent flow where advection and diffusion are important. There is no flow history incorporated in the conventional mixing length models; the prior development of the flow is ignored.

Recently, statistical approaches for handling turbulence have been considered by Townsend (Reference 148), Hinze (Reference 149), Rotta (Reference 3), and several others. The analysis of homogeneous isotropic turbulence can be handled quite readily by the statistical techniques, since the turbulent flow properties have a random distribution that tends to be Gaussian. The statistical methods have not proved tractable for nonisotropic turbulence in flows with large velocity gradients. Unfortunately, free turbulent mixing in jet plumes is characterized by large velocity and temperature gradients with nonisotropic turbulence. Consequently, the present analytical method was developed to incorporate a phenomenological approach in which the results were stated in measurable engineering quantities. At the same time, concepts from the statistical methods were utilized to develop universal models for the viscous transport properties. This led to adopting the turbulent kinetic energy (e) as another flow variable in the analysis. The inclusion of the conservation of turbulence energy permits the turbulence history to be monitored along with the local generation and decay.

The turbulent kinetic energy can be related to the local turbulence intensity by assuming local isotropy (Reference 150). The analysis thus relates the turbulent mixing to the mean velocity and the turbulence intensity. The turbulence intensity represents the standard deviation of the random turbulent velocity distribution. Thus, the statistical nature of the flow is retained by utilizing representative population parameters, but the analysis is tractable to numerical solution.

General Electric analysis is based on the work of Spalding and Patankar (Reference 5) as well as Bradshaw (Reference 151). Prior to the development of this plume-mixing model, the turbulent kinetic energy model had already been proven to be a valid approach for viscous flow in boundary layers (Reference 152). A similar model for free jets is also being used by Harsha (Reference 153).

The JETMIX analysis uses a numerical, finite difference technique to solve the partial differential form of the conventional boundary layer equations of motion. The use of the partial differential equations themselves, plus the use of local turbulence properties for the determination of the Reynold's stresses, allows the JETMIX analysis to apply equally well to the case of a free jet mixing with a static ambient environment or with a moving external stream. For example, for the case of laminar flow (which can be calculated by "turning off" the turbulence calculations), the JETMIX program yields the "exact" solution to the constant pressure mixing problem regardless of the velocity of the external stream. Similarly, the only approximation in the turbulent mixing problem lies in the semiempirical handling of the turbulence, not in the mathematical analysis. Nevertheless, since the JETMIX program monitors the local turbulence properties in the mixing region, this turbulence model can be expected to apply over a relatively wide range of conditions. Specifically, one would expect that the local mechanisms for the production and dissipation of turbulence would be unchanged by the velocity, temperature, pressure, or composition of the external flow in which the jet is placed (although the actual production and dissipation would, in general, be quite sensitive to the jet environment). Comparison of JETMIX predictions with experimental data over a wide range of mixing conditions including changes in all of these parameters has verified this speculation.

Finally, it should be noted that the JETMIX solution yields the local velocities, enthalpies, concentrations, and densities at each point in the flow field. Thus, once the JETMIX solution has been obtained, both the stream-wise variations and the cross-stream variations of all the significant parameters are available.

The JETMIX program is included in its full generality in the SSNOISE system, even though the acoustic model requires only a simple aerodynamic flow field for a single free turbulent jet. The use of the turbulence intensity and the mean flow profiles for noise prediction is described in Section 2.4.

1.3 SSFD

The aerodynamic characteristics of a supersonic exhaust jet may resemble either an inviscid two-dimensional flow field or a viscous mixing region, depending on the back pressure to which the jet exhausts. In the case where the back pressure is substantially different from the static pressure at the nozzle exit, the characteristic features of the jet are similar to an inviscid, two-dimensional flow field. This pressure mismatch generates an expansion fan or an oblique shock wave at the nozzle lip which adjusts the flow to the ambient pressure. However, as this initial disturbance propagates through the jet and reflects from the centerline, it causes the pressure to be overcorrected. This overcorrection represents the beginning of the familiar (nearly) periodic shock-cell structure. Quite naturally, the effects of friction are not altogether absent, but rather are restricted to a narrow

region on the outer edge of the jet. Because the viscous effects are confined to such a narrow region, the dominant characteristics of the flow field can be predicted by means of an inviscid two-dimensional analysis.

By way of contrast, if the nozzle is just precisely matched to the ambient pressure, no expansions or compressions take place at the nozzle exit, and the inviscid theory predicts a trivial, uniform, parallel flow field. However, experimental observations indicate that the flow field of this ideally expanded jet is dominated by viscous mixing in much the same way as are subsonic jets. Such a flow field can be predicted by means of a viscous, boundary layer analysis which assumes that the pressure throughout the entire plume is constant and is impressed by the external environment.

Despite the fact that each of the above classical approaches has application by itself, there are many problems which require the simultaneous inclusion of both two-dimensional and viscous mixing effects. For example, supersonic jets are seldom uniform, parallel, ideally expanded jets. Further, even though the dominant characteristics of the flow field of the nonideally expanded jet may be calculable by means of an inviscid analysis, there may be an interest in the mixing region itself. This latter situation is particularly true for such contemporary uses of jet flow field calculation techniques as prediction of the acoustic radiation, the infrared signature, or the combustion emissions of the jet.

A technique has been developed for calculating the flow field in a supersonic jet which includes both the two-dimensional effects which are characteristic of supersonic flow fields as well as the viscous mixing losses which are caused by turbulent stresses in the highly sheared regions of the jet. This technique divides the flow into an "inner" region in which the flow is supersonic and nearly inviscid, and an "outer" region where the viscous forces predominate. Coupling between the two regions is provided by including the viscous losses as known "right-hand-side" terms in the solution of the inner equations. Provision for handling discrete shock waves is included in the equations for the inner region, and an approximate technique which allows the shock to reflect at the centerline of an axisymmetric jet is also included. The viscous analysis of the "outer" region is referred to as the JETMIX computer program (Section 1.2). The analysis of the supersonic, nearly inviscid "inner" region is referred to as the Supersonic Finite Difference (SSFD) computer program. Other approaches to this problem have been considered in References 154 and 155, although their analyses were restricted to totally supersonic flow fields.

Since the flow in the inner region is supersonic, the (hyperbolic) governing equations could be solved by the classical method of characteristics procedure. However, an explicit finite difference algorithm is used since it is somewhat simpler and is more easily adaptable to matching between the "inner" and "outer" solutions. Section 2.1 points out that the (parabolic) boundary layer equations characterizing the outer region are solved by a similar finite difference technique. Although the field points are calculated by a finite difference technique, the enforcement of boundary conditions and calculation of shock propagation are accomplished with method of characteristics procedures.

The equations for the inner region require that the "right-hand-side" terms, reflecting variations in entropy and stagnation enthalpy due to the action of turbulent stresses, must be specified before a solution is calculated. Thus, the JETMIX analysis must first be applied to the entire jet in order to allow approximate calculation of these terms. Then, the SSFD analysis if used to recalculate the flow field in the inner region.

1.4 MERGE

The MERGE computer program is used to combine the output of JETMIX and SSFD prior to its use in the NOISE program. Specifically, the velocity and turbulence energy profiles computed in the SSFD program for the supersonic portion of the jet plume override those computed by JETMIX. The JETMIX profiles in the subsonic portion of the plume are retained.

1.5 NOISE

In the previous sections, program descriptions were given for the aerodynamic flow field predictive schemes for subsonic and supersonic (shock-free and shocked) exhaust jets. One of the key aspects of these aerodynamic programs, from a noise point of view, is that they are turbulent mixing analyses of which a primary output is the turbulent kinetic energy. With the output from such programs, it was quite feasible to utilize acoustic models whose source terms were functions of the aerodynamic input, thus the name aeroacoustic turbulent mixing. General Electric has devoted time to examining the advantages and disadvantages of such models. References 1, 10, 77, and 156 discuss many of the details of this work. Appendix 6 gives a detailed account of the models available in this document.

The basic turbulent mixing (or velocity fluctuation) noise theory which can best serve as an example to illustrate the relationships between the acoustic far-field and the detailed aerodynamic properties of an exhaust jet is the Lighthill/Ffowcs-Williams convected quadrupole theory. This theory is founded on the hypothesis that individual and uncorrelated volumes emit acoustic energy given by the relationship:

$$\frac{\overline{P'^2}}{\rho_o a_o} = \frac{V_e \, \omega^4 \, \overline{T}^2}{\rho_o a_o^5} \quad \frac{1}{4\pi R^2} \left[(1 - M_c \cos \Theta)^2 + \left(\frac{\omega \ell}{a_o}\right)^2 \right]^{-5/2}$$

where R is the distance between the source term of turbulence and the point of observation; V_e, the uncorrelated eddy volume; ω, the radiation frequency of fluctuation in a reference system moving at an eddy convection speed V_c; $\overline{T}^2$, the mean square value of the quadrupole strength; θ, the angle between the direction of sound emission and the jet axis; M_c the ratio of eddy correction speed to the sound speed of the ambient gas; and, ℓ, the scale of turbulence. With the assumptions $V_e = \ell^3$, $\overline{T}^2 = \rho^2 U^4$ and a frequency-eddy-shear assumption due to P.O.A.L. Davies that $\omega\ell \tilde{\ } 1.1u'$, our acoustic

equation transforms into a quite tractable form directly linking the local aerodynamic properties with the acoustic far-field (or near-field as will be shown in Appendix 6):

$$\overline{p'^2} \sim \frac{1}{4\pi R^2} \frac{\rho^2 u'^4 \bar{u}^{-4}}{\rho_o a_o^4 \ell} \left[(1 - M_c \cos\theta)^2 + \left(\frac{1.1u'}{a_o}\right)^2 \right]^{-5/2}$$

To further translate this simple expression to perform detailed acoustic predictions, the flowfield is divided into small-volume elements in the form of circular ring elements of incremental volume $V = 2\pi r \Delta r \Delta x$ (see Figure 246), based on the compactness assumption that each volume element is considered to be a sound generator which emits acoustic energy at a specified frequency determined by the P.O.A.L. Davies frequency-eddy-shear assumption (or some similar assumptions). For the whole jet then, the mean square sound pressures from all circular ring regions can be combined computationally to give overall mean square sound pressure, sound pressure spectra, overall sound power spectra, or overall power level.

The NOISE program contained in this document includes, in addition to the model described above, several other philosophically similar turbulent mixing aeroacoustic models. They are Ribners, a classical Lilley model, and a model by Pao.

An item which is important to the predictive aspects of aerodynamic noise, as well as for understanding jet noise emission, is how to account for the influence of the physical flowfield on the noise source itself. The work of Mani, described in detail in Volume II of this final report, shows that the fluid shrouding of the noise source goes a long way toward accounting for the convective/refractive coupling of the acoustic radiation. Appendix 6 will discuss a method by which this technique can be linked with the above-cited turbulent mixing models.

1.6 SSNOISE CALCULATION STEPS AND FLOW CHART

The processing flow chart depicting the flow of data between the various programs in the SSNOISE system is shown in Figure 247. The core program in the system is JETMIX, which provides aerodynamic data to be used in SSFD, MERGE, or NOISE. The files shown in Figure 247 may be either disc or tape and contain the following data:

File 1 - JETMIX Restart file (normally tape)
Contains aerodynamic data from a partial execution of JETMIX (File 2).

File 2 - JETMIX Output file
Contains aerodynamic data from a JETMIX execution. Used as an input file to SSFD, MERGE, or NOISE.

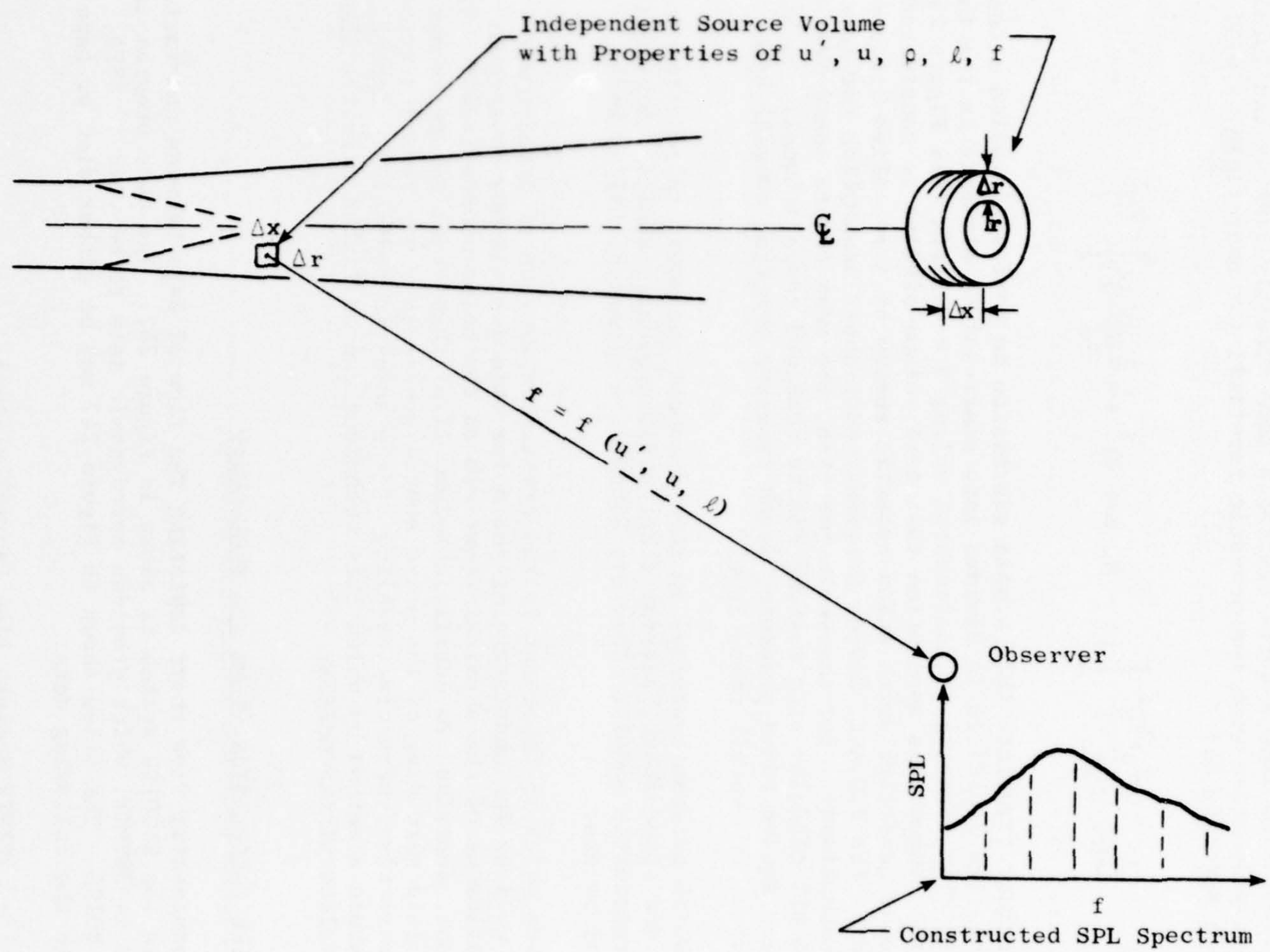


Figure 246. Schematic of General Electric Jet Aeroacoustic Computational Procedure.

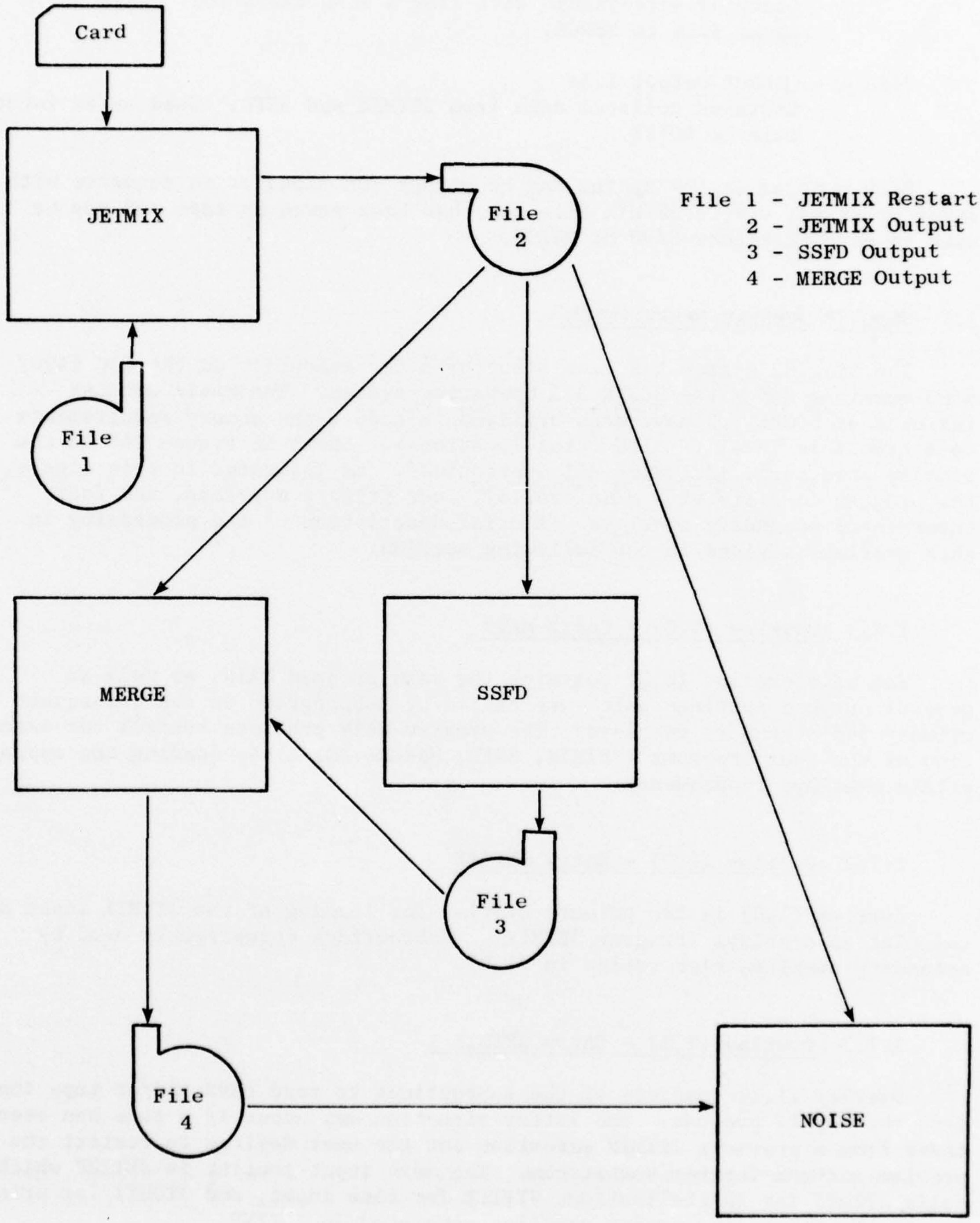


Figure 247. SSNOISE Calculation Flow Chart.

File 3 - SSFD Output file
Contains aerodynamic data from a SSFD execution. Used as an input file to MERGE.

File 4 - MERGE Output file
Contains collated data from JETMIX and SSFD. Used as an input file to NOISE.

Each program in the system may be either run alone or in sequence with other programs; viz, a JETMIX file that has been saved on tape and may be used to execute either SSFD or NOISE.

1.7 SSNOISE OVERLAY DESCRIPTION

The SSNOISE system has been structured for execution on the CDC 6400/6600 machines under the SCOPE 3.3 operating system. The basic OVERLAY features of SCOPE 3.3 have been utilized to reduce the memory requirements to a tractable level (< 110K octal locations). Shown in Figure 248 is the overlay structure, including all subroutines. As indicated in this figure, the program consists of a main overlay, four primary overlays, and four subordinate secondary overlays. A brief description of the processing in each overlay is given in the following section.

1.7.1 Overlay (0,0) - Entry MAIN

The main overlay (0,0) contains the main program MAIN, as well as general purpose routines which are called by subprograms in the subsequent primary and secondary overlays. The program MAIN provides control for execution of the four programs (JETMIX, SSFD, MERGE, NOISE) by loading the appropriate overlays in sequence.

1.7.2 Overlay (1,0) - Entry JETMIX

Overlay (1,0) is the primary overlay for loading of the JETMIX input and calculation overlays (Program JETMIX). Subroutines concurrently used by secondary overlays also reside in (1,0).

1.7.3 Overlay (1,1) - Entry JETMIX 1

Overlay (1,1) consists of the subroutines to read card and/or tape input into the JETMIX program. The latter situation may occur if a tape has been saved from a previous JETMIX execution and the user desires to restart the problem and run further downstream. The main input routine is JETINP which calls JTINIT for initialization, JTFILE for tape input, and JTOUT1 for printing of the input and initial profiles generated in JETINP.

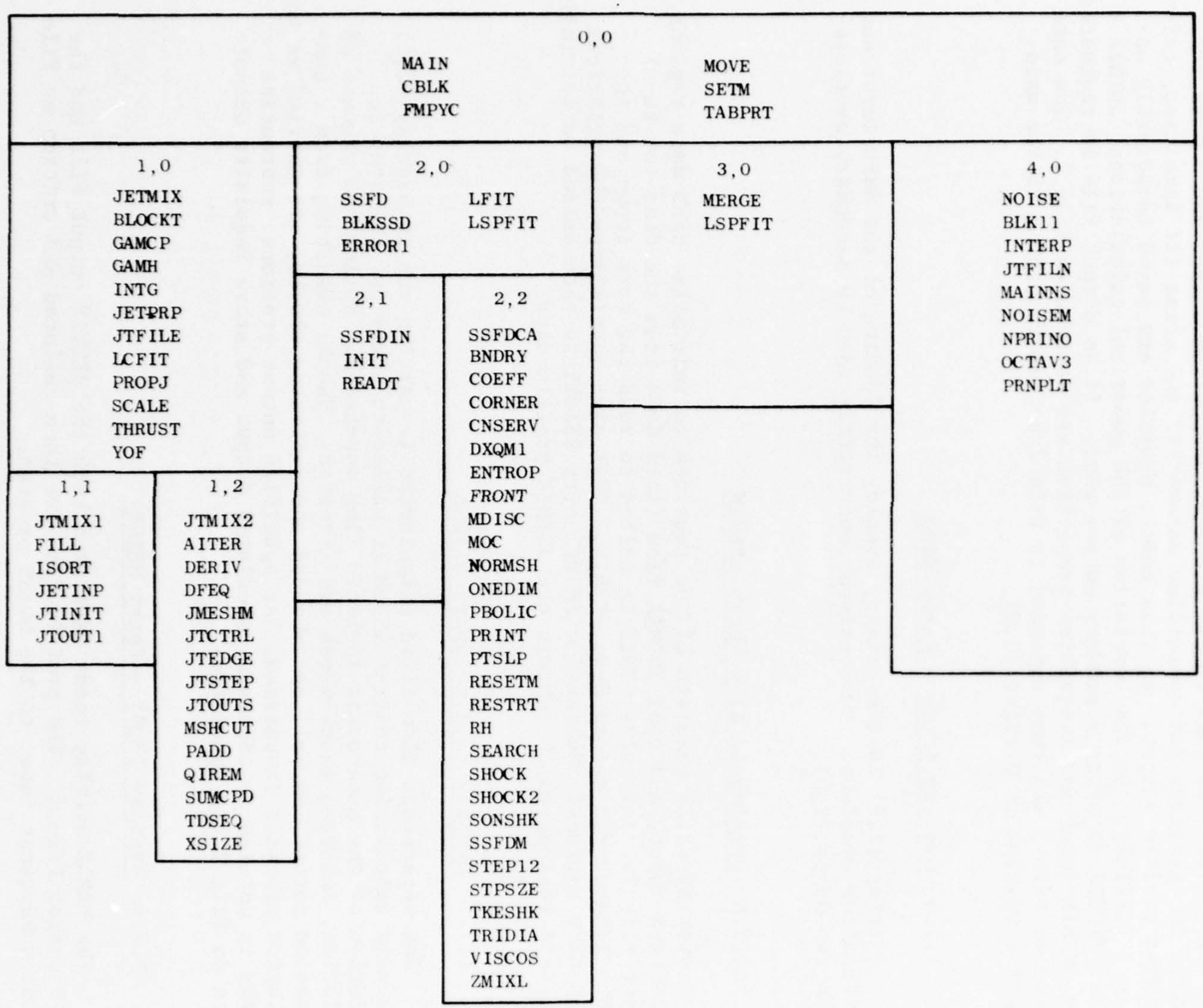


Figure 248. Overlay Structure, Including All Subroutines.

1.7.4 Overlay (1,2) - Entry JETMIX 2

The bulk of the numerical calculations of the mixing flow field is carried out in Overlay (1,2). The primary entry, JETMIX 2, initially calls the control routine JTCTRL which, in turn, calls the main calculation routine JTSTEP. At each output station, subroutine JETPRP and JTOUTS are called to calculate jet centerline parameters and print (if specified) calculated profile output. At this point, profiles are saved temporarily on File 3 (JTFILE). At the completion of the numerical calculations, JETMIX 2 calls JTOUTS to print a summary output page. If an output file is requested, the JETMIX input and centerline properties are written on File 2. The data saved on File 3 are then appended to File 2 before returning to the main control routine in Overlay (0,0).

1.7.5 Overlay (2,0) - Entry SSFD

Overlay (2,0) is the primary overlay for loading of the SSFD input and calculation overlays. Subroutines concurrently used by secondary overlays also reside in (2,0).

1.7.6 Overlay (2,1) - Entry SSFDIN

Overlay (2,1) consists of the routines to initialize SSFD data regions, read card input, and read JETMIX flow field data from the disc (or tape) input File 2. Initially, INIT is called to read the card input and the centerline output record from JETMIX. INIT also initializes the principal SSFD data regions. Subroutine READT entry READT1 is then called to initialize the data regions which contain the JETMIX profile data.

1.7.7 Overlay (2,2) - Entry SSFDCA

The supersonic flow field calculation is carried out in Overlay (2,2). The main calculation routine SSFDM is called to carry out the stepwise solution of the supersonic inviscid flow equations. During the process of solution, imbedded shock waves are detected. Shocks emanating from a compression corner, as well as imbedded and reflected shocks, are carried as the solution proceeds downstream. At specified output stations, subroutine PRINT is entered to tabulate calculated output and store requisite output data on File 3 (if specified).

1.7.8 Overlay (3,0) - Entry MERGE

The MERGE overlay reads data from both the JETMIX output File and the SSFD output File 3. The profile data are then collated and written as File 4 for subsequent input to the NOISE program.

1.7.9 Overlay (4,0) - Entry MAINNS

The final overlay in the SSNOISE system contains the routines for calculation of the aerodynamically generated jet noise.

2.0 PROGRAM INPUT

2.1 GENERAL DESCRIPTION

The following sections are concerned with the input to the four programs comprising the SSNOISE system. Each program may be either run alone or in sequence. The standard SCOPE file INPUT is used for card input. For each program, selected input will reside on a data file (TAPE1, TAPE2, TAPE3, TAPE4) which may be either disc or magnetic tape. The input sheets for the programs JETMIX, SSFD, MERGE, and NOISE are given in Appendix 9. An initial prefix input set, consisting of identification information, is read once in a given run using fixed-field format (6A10). The first three cards of the input deck consist of the name and address of the user and the problem identification.

Card No.	Cols.	
1	2-61	User name (1-60 alphanumeric characters)
2	2-61	User address or location (1-60 alphanumeric characters)
3	2-61	Problem identification (1-60 alphanumeric characters)

Blank cards may be substituted for input quantities not required.

The input parameters for each program are given in the following sections. Included in these descriptions are the input items appearing on the input sheets as well as input items not normally required.

2.2 JETMIX INPUT

The first card of the input set is a header card consisting of the program name JETMIX starting in Column 2, and a T or an F in both Columns 12 and 14.

Card Column	Description
2	JETMIX - Denotes program name
12	Input file (tape) ? (T or F)
14	Output file (disc or tape) ? (T or F)

The header card is followed by the NAMELIST $A and the associated JETMIX input data. The NAMELIST input is terminated with a $ in Column 2.

2.2.1 Problem Specification

The input quantities MIX, AXI, and TWO define the type of problem. The allowable combinations are:

MIX = F	AXI = T / F
	TWO = T / F
MIX = T	AXI = T / F
	TWO = F

If these quantities are not input, the case will be taken as a free, axisymmetric, single jet. This is normally the predominant type of JETMIX run within the SSNOISE system.

Parameter	Description	Preset Value
MIX	Problem type F - Free jet mixing T - Confined jet mixing	F
AXI	Flow field type T - Axisymmetric F - Plane (2D)	T
TWO	Jet configuration F - Single mixing region T - Coannular/coplanar mixing region	F

2.2.2 Description of Primary and Secondary Jets

The jet streams must be defined in terms of either Mach number or stagnation pressure.

Optional inputs are turbulence intensity, static temperature, and velocity. If turbulence intensities are not specified, the jet(s) will be assumed laminar. Either static temperature or velocity may be specified. If these quantities are not input, the velocity corresponding to SLS ambient conditions will be computed.

Parameter	Description	Preset Value
DIAJ	Diameter (AXI=T) or 2× half-height (AXI=F) of primary jet, in.	---
MJET	Primary jet Mach number	bits
PTJET	Primary jet stagnation pressure, psia	bits
TIJET	Primary jet turbulence intensity	0
TJET	Primary jet static temperature, ° R	518.688
VJET	Primary jet velocity, fps	---
DIAO	Diameter (AXI=T) or 2× half-height (AXI=F) of secondary jet, in.	---
MJETO	Secondary jet Mach number	bits
PTJETO	Secondary jet stagnation pressure, psia	bits
TIJETO	Secondary jet turbulence intensity	0
TJETO	Secondary jet static temperature, ° R	518.688
VJETO	Secondary jet velocity, fps	---

2.2.3 External Boundary Conditions

For free-mixing problems, the external boundary conditions are constant. For confined-mixing problems, the external boundary condition input denotes quantities at the discharge plane of the jet. Specify static pressure, static temperature, and either Mach number or velocity.

Parameter	Description	Preset Value
PE	Static pressure, psia	14.69594
TE	External stream static temperature, ° R	518.688
TIE	External stream turbulence intensity	0
ME	External stream Mach number	---
VE	External stream velocity, fps	---

2.2.4 Fluid Properties

The fluid viscosity is computed as a function of temperature using the Sutherland relationship:

$$\mu = \text{MUREF} \times \left(\frac{T}{\text{TREF}}\right)^{3/2} \times \frac{(\text{TREF}+\text{SC})}{(\ T\ +\text{SC})}$$

If no input is given, the fluid is assumed to be air.

Parameter	Description	Preset Value
RG	Gas constant, ft lbf/lbm ° R	53.34 (air)
PR	Prandtl number	0.72 (air)
PRT	Turbulent Prandtl number	1.0
SC	Sutherland constant for viscosity calculation, ° R	---
MUREF	Reference viscosity @ TREF, lbm/ft sec	---
TREF	Reference temperature, ° R	---

2.2.5 Step-Size Controls/Restart

The input parameters CXPC and CXTP control the streamwise step size in the potential core and transition/similar regions of the jet. In the potential core zone, the step size is taken as a fraction of the width of the primary mixing zone:

$$\Delta X_{pc} = \text{CXPC} \times b$$

Following disappearance of the potential core, the step size is taken as a fraction of the jet radius or half-height:

$$\Delta X_{ts} = \text{CXTP} \times Y_J$$

As the stepwise solution proceeds downstream, streamlines are added at the outer edge of the jet. Specification of CXPC and CXTP is equivalent to artificially specifying the rate of entrainment of ambient fluid into the jet. In certain cases, the step size may be too large (entrainment rate too small), and the solution for the effective edge of the jet may experience problems.

These problems are usually manifested by a square root of a negative number in subroutine JTEDGE, and may be rectified by decreasing the value of CXPC and/or CXTP. The preset values CXPC = CXTP = 0.02 have been adequate for most cases run to date.

A problem may be restarted from tape at a given X or XD station using the input RESTRT. The value of RESTRT must appear in the X or XD table, and the profiles must be stored on tape at the restart station. For continuation of confined mixing problems using the free-mixing option (MIX=F), input the normalized restart station.

Parameter	Description	Preset Value
CXPC	Step size control - potential core region. Fractional % of mixing zone width	0.02
CXTP	Step size control - transition/similar region. Fractional % of jet radius or half-height	0.02
RESTRT	X or XD station for restart of problem	---

2.2.6 Turbulence Scale Calculations

The characteristic length scale of the jet turbulence is assumed independent of the transverse coordinate and is expressed in terms of the geometric parameters of the jet and the jet Mach number using the following semi-empirical relations:

Single Jet

1) Region 1 (Potential Core Present)

$$L_{t1} = C_{t1} \times b \times (1 + C_{t2} M_J)^{-1}$$

2) Region 3 (Similar Profiles)

$$L_{t3} = C_{t8} Y_J$$

3) Region 2 (Transition Region)

The turbulence length scale in the transition region is less well defined than those in the potential core and similar regions, in that experimental data are sparse or nonexistent. The input parameter LTERP may be used to select either a linear or an exponential variation of scale in the transition region:

(Linear):

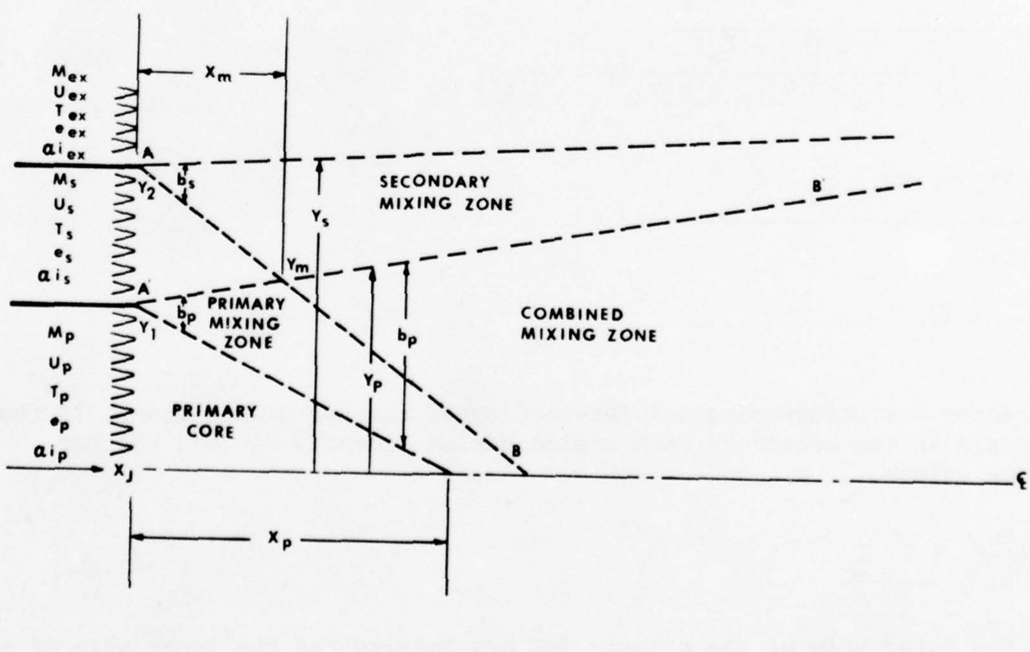
$$L_{t2} = [C_{t1}\ (1+C_{t2}\ M_J)^{-1}\left(2 - \frac{x}{x_c}\right) + C_{t8}\left(\frac{x}{x_c} - 1\right)]\ Y_J$$

(Exponential):

$$L_{t2} = \left\{C_{t3}\ (1+C_{t5}\ M_J)^{-1}\left(\frac{x}{x_c}\right)\exp\left[C_{t4}\ (C_{t6}+C_{t7}\ M_J)\right]\right\} Y_J$$

2.2.7 Coannular/Coplanar Jet

The turbulence length scale for a coannular/coplanar jet is based on an empirical geometric model. A schematic diagram of the dual jet flow field, with pertinent symbols, is shown below:



The model is described as follows:

$$X_J \leq X \leq X_m$$

The region $X_J \leq X \leq X_m$, upstream of the point where the secondary core disappears consists of two independent jets which mix in somewhat the same manner as the previously described single jet. The turbulence length scale is defined in terms of the scale in the two mixing regions as follows:

$$L_p = C_{tp} b_p (1 + C_{t2} M_p)^{-1}$$

$$L_S = C_{ts} b_s (1 + C_{t2} M_s)^{-1}$$

a.) $\underline{0 \leq Y \leq .9Y_p}$

$$L = L_p$$

b.) $\underline{.9Y_p \quad Y \quad (Y_s - .9b_s)}$

$$L = L_p + \frac{(L_s - L_p)}{Y_s - .9(L_p + b_s)} (Y - .9Y_p)$$

c.) $\underline{(Y_s - .9b_s) \leq Y < Y_s}$

$$L = L_s$$

The factor 0.9 allows marginal interaction of the two mixing zones, in that the scale in the secondary core region varies linearly between the two extreme values.

$\underline{X_m < X < X_p}$

When the outer edge of the primary jet has intersected the inner edge of the secondary jet, the secondary potential core disappears. The co-ordinates of the boundaries of the combined mixing zone are determined by fitting a linear curve between the jet corner co-ordinates and the merge point; viz,

$$\text{A'B'} \quad Y = Y_1 + \left(\frac{Y_m - Y_1}{X_m - X_J}\right) (X - X_J)$$
(outer boundary)

$$\text{AB} \quad Y = Y_2 + \left(\frac{Y_m - Y_2}{X_m - X_J}\right) (X - X_J)$$
(inner boundary)

For the situation shown in the sketch, the scale may be defined as:

a.) $Y \leq .9*(Y_s - b_s)$

$L = L_p$

b.) $.9*(Y_s - b_s) < Y < Y_s - .9(Y_s - Y_p)$

$$L = L_p + \frac{(L_s - L_p)}{.9(Y_p + b_s) - .8Y_s} \left[Y - .9*(Y_s - b_s)\right]$$

c.) $\left[Y_s - .9(Y_s - Y_p)\right] \geq Y$

$L = L_s$

special situations occur as follows:

If $b_s \geq Y_s$, set $b_s = Y_s$

a.) $0 < Y < \left[Y_s - .9 * (Y_s - Y_p)\right]$

$$L = L_p + \frac{(L_s - L_p)}{.9(Y_p + b_s) - .8Y_s} \left[Y - .9*(Y_s - b_s)\right]$$

b.) $\left[Y_s - .9 * (Y_s - Y_p)\right] \leq Y$

$L = L_s$

If $Y_p \geq Y_s$, set $Y_p = Y_s$

a.) $0 < Y < .9 * (Y_s - b_s)$

$$L = L_p$$

b.) $.9 * (Y_s - b_s) \leq Y$

$$L = L_p + \frac{(L_s - L_p)}{.9(Y_p + b_s) - .8Y_s} \quad Y - .9(Y_s - b_s)$$

In the region downstream of the point where the primary core has disappeared, the combined mixing cone scale is redefined to:

$$L_p = C_{tm} b_p (1 + C_{t2} M_p)^{-1}$$

The numerical values assigned to the constants for the single- and dual-jet geometries are:

Parameter	Description	Preset Value
LTERP	Transition region scale selection T - Linear variation F - Exponential variation	T
CT1		0.23
CT2		0.38
CT3		0.23
CT4	Constants for definition of turbulence scale of single jet	0.05
CT5		0.38
CT6		1.4
CT7		0.43
CT8		0.1875
CTP	Constants for definition of turbulence scale of coannular/coplanar jet	0.175
CTS		0.23
CTM		0.23

2.2.8 Transverse Mesh Control

A semiuniform mesh is utilized in the potential core region. The number of streamlines in the initial discharge plane of the jet may be altered using the inputs NJ and NJO (NJ is the number of streamlines in the primary jet), whereas the difference between NJ and NJO is the number of streamlines in the secondary jet (if present). In the potential core zone, streamlines are added at a constant $\Delta\psi$ until a maximum (NM) is reached. At this point, the number of streamlines is reduced and the mesh refined. The semiuniform streamline distribution is maintained until the potential core disappears. Downstream of this point, the jet grows rapidly, and it becomes advantageous to redefine the mesh. The streamlines are redistributed such that the ratio of $\Delta\psi$'s for any two adjacent intervals is a constant. The distance of the i-th streamline is:

$$\psi_i = \Delta\psi_1 \frac{(K^{i-1} - 1)}{(K-1)}$$

where, K = mesh constant

$\Delta\psi_1$ = initial $\Delta\psi$

$\psi_i/\psi_e = 1$ @ i = NMSH

Parameter	Description	Preset Value
NJ	No. of streamlines in primary jet	30
NJO	Streamline number of secondary jet edge	50
NM	Maximum number of streamlines before mesh redistribution occurs	80
NMSH		71
DY1	Mesh parameters (see above)	.001
CK		1.06064475

2.2.9 Species Diffusion Input

The JETMIX program contains the option to consider the diffusion of up to six chemically inert constituents. The input for a case of this type given on JETMIX input sheet 1a, and includes variables to define the mole concentration of the jet streams, boundary conditions, effective Schmidt numbers, and coefficients for the molar heat capacity of each constituent. The NC, CNAME input variables are provided to designate names of the species. Note that this option may not be used if NAMELIST does not permit hollerith input. The molar heat capacities of the individual constituents are computed as a quadratic function of local temperature T; viz, $C_p = a + bT + cT^2$.

Parameter	Description	Preset Value
DIFF	Species Diffusion F - No T - Yes	F
NC	Number of constituents	3
CNAME	Name of constituents	AIR, CO2, H20
ALJ	Primary jet stream species mole fractions, moles i/mole mixture	.92, .04, .04
ALJO	Secondary jet stream species mole fractions, moles i/mole mixture	.96, .02, .02
ALE	External (boundary) species mole fractions, moles i/mole mixture	.99934, .00033, .00033
SCM	Effective Schmidt number for individual species	.7
CPC	Coefficients in polynomial representation of molar heat capacities (see input sheet JETMIX/1a)	---

2.2.10 Station Input

The following parameters are termed "station input" and are used to define the print/data file stations in the free-jet case and boundary coordinates in the confined-mixing case. In the latter situation, the streamwise coordinate also serves as identification for printing. Station data may be input in column format using the B array or in "free form" using the symbolic names associated with the columns of the B block. When no station input is supplied, the JETMIX program uses a set of input coordinates which has been optimized for use in acoustic calculations.

Parameter	Description
B	Input block for station data. See JETMIX input sheet 2 and associated notes on station data. The preset symbolic names assigned to each column of the B block are: Free mixing X, XPRN Confined mixing XD, RD, YCB, XPRN Data set to bits* will be interpolated relative to X, or the last value in the table will be automatically extended down the column. Up to 100 stations may be input. * bits = 1×10^{15} (junk word)

X	Dimensionless streamwise coordinate (free mixing), x/d_j
XD	Streamwise coordinate, in. (Confined mixing)
RD	Outer boundary coordinate, in. (Confined mixing)
YCB	Inner boundary coordinate, in. (Confined mixing)
XPRN	Profile print/file indicator:

0 - Profile not printed or saved on file 2

1 - Profile printed and saved on file 2

-1 - Profile saved on file 2 but not printed

XPRN(1)= 2 - All profiles printed and saved on file 2

XPRN(1)=-2 - All profiles saved on file 2 but not printed.

The various types of input are best illustrated by use of an example:

Confined mixing in an annular duct - 5 stations (0, 2, 4, 6, 8 inches) with radii (1, 2, 3, 4, 5 inches). Centerbody radius - 0.1 inch.

Print all stations.

Sheet JETMIX-2

2	XD	RD	YCB	XPRN
B (1) =	0.,	1.,	.1,	1.,
	2.,	2.,	.1,	1.,
	4.,	3.,	.1,	1.,
	6.,	4.,	.1,	1.,
	8.,	5.,	.1,	1.,

Free Form

2

XD (1) , 2., 4., 6., 8.,

RD (1) = 1., 2., 3., 4., 5.,

YCB (1) = 0.1,

XPRN (1) = 2,

This form of input is useful for modifying input data reclaimed from an input tape 1. Suppose it is desired to add 5 or more stations with duct and plug radii equal to those at the 5th station:

2

XD (6) = 10, 12, 14, 16, 18,

The balance of the RD and YCB arrays will be filled with the values of 5. and 0.1, respectively. As in the case of tabular input, missing input will be linearly interpolated or appended as required.

Station data input via the B block will override corresponding free-form input. Inadvertent destruction of the free-form input may be avoided by selectively designating positions in the B array.

2.3 SSFD INPUT

The first card of the input set is a header card consisting of the program name SSFD starting in Column 2, and a T or an F in both columns 12 and 14.

Card Column	Description
2	SSFD - Denotes program name
14	Input file (tape) ? (T or F)
16	Output file (disc or tape) ? (T or F)

The header card is followed by the NAMELIST, $INPUT, and the associated SSFD input data. The NAMELIST input is terminated with a $ in column 2.

2.3.1 Problem Description

The input quantities AXISYM, XMACH, and GAMMA define the type of problem. Note that XMACH is the actual initial Mach number, not the ideally expanded Mach number, and generally will be different from the input quantity MJET in JETMIX. Also note that the specific heat ratio must be input twice (i.e., GAMMA (1) = 1.4, 1.4), and that the two values must be identical for normal program operation.

Parameter	Description	Preset Value
AXISYM	T - Axisymmetric flow field F - Plane (2-D) flow field	T
XMACH	Initial Mach number	1.05
GAMMA (1)	Specific heat ratio	1.4, 1.4

2.3.2 Program Controls

The input quantities XL, STABIL, and IPRINT control the streamwise distance over which the calculation proceeds, the streamwise step size used in the finite difference solution, and the program output, respectively. XL is preset so that SSFD will terminate upon reaching the end of the potential core region (as determined by JETMIX). The maximum allowable streamwise step size at any axial station is set by the requirement that characteristics from adjoining (cross-stream) points in the finite difference mesh must not intersect between stations (CFL condition). The step size which is used in SSFD is the product of this maximum step size multiplied by the stability parameter STABIL. If difficulties are encountered in obtaining an SSFD solution, it may be necessary to decrease the value of STABIL.

Parameter	Description	Preset Value
XL	Final value of x/d_j	(see above)
STABIL	Stability parameter for step-size control	0.5
IPRINT	1 - Print profiles and shock pattern 0 - No print	1

2.3.3 Total-Pressure Input Stations

SSFD uses total-pressure data from the JETMIX solution at the stations XPT. These are preset to:

XPT (1) = 0, .1, .2, .3, .4, .5, .7, 1, 2, 2.5, 3, 4, 5, 6.2, 7.5, 9, 11, 13, 15, 20.

Parameter	Description	Preset Value
NPT	Number of stations for total-pressure input	20
XPT	Stations at which total-pressure data are taken from JETMIX solution, x/d_j	(see above)

Optional Input Parameters

The following quantities were originally included as input variables either to allow SSFD to be run without direct coupling to JETMIX or for control of diagnostic printout which was used in debugging SSFD. They have been retained to preserve full program capabilities, but are no longer required.

Parameter	Definition
NJ	No longer used
X	Initial value of x/r_j
SSTRM	Is there a slipstream at interface of inner/outer streams? (Logical)
NJJ	Number of initial grid points
RSTART	Is this a restart of a previous run? (Logical)
TANTH	Tangent (v/u) of flow angle at initial grid points
ZM	Mach number at initial grid points
PRESS	Static pressure (p/p_{tj}) at initial grid points
THETA	Flow angle ($\tan^{-1}$ v/u) at initial grid points
YIN	Radial location (y/r_j) of initial grid points
PT	Total pressure (p_t/p_{tj}) at initial grid points
TT	Total temperature (T_t/T_{tj}) of streams at initial station
XLOW	x/r_j coordinates of stream lower boundaries
YLOW	y/r_j coordinates of stream lower boundaries
XUP	x/r_j coordinates of stream upper boundaries
YUP	y/r_j coordinates of stream upper boundaries
PUP	Static pressure (p/p_{tj}) on stream upper boundaries
PLOW	Static pressure (p/p_{tj}) on stream lower boundaries
PTOT	Total pressure (p_t/p_{tj}) in JETMIX flow field
PSIPT	Streamline coordinates (ψ) for total-pressure input
YBAR	y/r_j coordinates at initial station (in place of equal spacing).
IPUNCH	Are cards to be punched for restart? (Logical)
XMDISC	x/r_j coordinate of Mach disc
XSAVE	x/r_j coordinate of profile to be saved for restart

Parameter	Definition
IDISC	Control variable for Mach disc/restart
MDISCC	Is there to be a Mach disc? (Logical)
BARPRT	Print control (Logical)
IPRTC	Print control
XBDY	Print control (x/r_j)
XPR	Print control (x/r_j)
SHKPRT	Print control (Logical)
XTKESH	Print control (x/r_j)
XTKESF	Print control (x/r_j)
XRESET	Print control (x/r_j)
XENTRO	Print control (x/r_j)
XTKEPR	Print control (x/r_j)

The subscript "j" has been used to denote nozzle exit-plane properties.

2.4 MERGE

No card input is required for the MERGE program with the exception of the following header card:

Card Column	Description
2	MERGE - Denotes program name
12	T - Denotes input files (2 and 3)
14	T - Denotes output file (4)

2.5 NOISE INPUT

The first card of the input set is a header card consisting of the program name NOISE starting in Column 2, and a T or an F in both columns 12 and 14.

Card Column	Description
2	NOISE - Denotes program name
14	Input file (tape)? (T or F)
16	Output file (disc or tape)? (T or F)

The header card is followed by the NAMELIST $A on the associated NOISE input data. The NAMELIST input is terminated with a $ in Column 2.

2.5.1 General Input

The input quantity MFILE denotes the input file code for the aerodynamic data:

Parameter	Description	Nominal Value
MFILE	An input file code for either JETMIX (set to 2) or MERGE (set to 4)	2

In addition to the aerodynamic data file selection, a series of quantities is necessary as input before selection of the acoustic models. These input parameters are defined as follows:

Parameter	Description	Nominal Value
SCALT	Average Source-Receiver Doppler Shift	.5
SCALJ	Jet Scale Factor (Model size to full size)	1.
PREFN	Reference Acoustic Pressure for Sound Pressure Level (dynes/cm^2)	.0002
BAND3	Selector for 1/3-Octave Band calculation (T selects 1/3-Octave Band; F selects Octave Band)	F
MC	Selection of Fixed or Variable Convection Mach Number (0 selects a fixed convection Mach Number; 1 selects a variable convection Mach Number)	0
CVMACH	The convection Mach No. Constant	.63
BETAIN	Will BETA be input? (T or F)	F

BETA	An Acoustic Intensity Proportionality Constant - .00425 for a cold jet, .002125 for a hot jet	.00425
JETTEM	Indicator for a Hot or Cold Jet (0 - cold jet, 1 - hot jet)	0
QCONV	T or F Selector for the Convection Singularity Function (F, $q = 1.1u'/a_o$; T, $q = \alpha\, u/a_o$)	F

2.5.2 Acoustic Model Selection

The NOISE program allows the operator to select a number of far-field or near-field acoustic models. The far-field acoustic models are of the Lighthill (LIGHTH), Ribner (RIBNER), or Pao (PAO) forms. Appendix 8 discusses the analysis incorporated in each model.

Parameter	Description	Nominal Value
LIGHTH	Lighthill selection (0, self-noise alone; 1, self-noise + shear-noise)	0
LILLEY	T or F Selection of Classical Lilley Model	F
RIBNER	T or F Selection of Classical Ribner Model	F
CRIB	Acoustic Intensity Proportionality Constant in Ribner's Model (0, self-noise only)	.2577
SE	Selection for Shear Noise in Ribner Model (0, shear noise only)	1
PAØ	T or F Selection of Classical Pao Model	F
PSPEC	Selection of Pao Pressure Spectrum Calculation (T or F)	F
MU	Selection of Type of Pao Model (0, self- and shear noise, 1, self-noise alone, 2, shear noise alone)	0

As for the far-field acoustic models, there are a number of near-field acoustic models the user may select. Their descriptions are contained in Appendix 8.

NEARFD =
1 - Isotropic turbulence model
2 - Lateral quadrupole model
3 - Longitudinal quadrupole model
4 - Combination model using lateral quadrupole in transition region
5 - Combination model using longitudial quadrupole model in transition region

2.5.3 Microphone Selection

In order for the user to have acoustic prediction printed, the number of angle locations (NA) and the actual polar angles (referenced to the jet axis) must be specified. Additionally, an arc or sideline prediction can be made.

Parameter	Description	Nominal Value
NA	Number of input angles (1 through 20)	Must input
ANGJ	Angle (in degrees) input (a maximum of 20 angles may be specified)	Must input
ARC	F - Sideline configuration T - Arc configuration	F
SLINE	Sideline distance in feet	---
ARCL	Arc distance in feet	---

2.5.4 Output Control Cards

In addition to the normal program output of OASPL, SPL, PWL, etc., detailed acoustic profiles can be computed and pointed out. These detailed acoustic profiles are controlled by the parameter ACSPAN and ACOUSP.

Parameter	Description	Nominal Value
ACSPAN	(T or F) Acoustic radial profile computation at a radial location for a given angle (specify T for each angle)	F
ACOUSP	(T or F) Acoustic profile indicator for axial locations specified from JETMIX (Specify T for each X station)	F

3.0 PROGRAM OUTPUT

3.1 GENERAL DESCRIPTION

The output from the SSNOISE system may be logically divided into the following two sections:

1) Card input and preliminary printout

2) Specific output generated by each program in the system

The initial section of output consists of a card image print of the problem input and a designation of the tape (disc) input/output file selections; viz, TAPIN = $\frac{T}{F}$ and TAPOT = $\frac{T}{F}$. Upon completion of the card image print, the file TAPE5 is rewound to its original status. The output from the programs follows the section of preliminary printout and is described in the following sections:

3.2 JETMIX PROGRAM OUTPUT

The output from the JETMIX program consists principally of the dimensional and dimensionless profiles at designated calculation stations and the properties along the jet axis of symmetry. Profile printout will always occur at the stations inserted by the program. These inserted stations are:

1) Potential core disappearance

2) Supersonic core disappearance

3) Merge station of coannular/coplanar jet

The above profile printout is preceded by the defined and calculated reference conditions and the initial profiles (U, E, θ, α_i) at the discharge plane of the jet. The calculated output variables in their literal order of appearance in the printout are as follows:

Dimensionless and Dimensional Profiles

Print Heading	Description
Y	Dimensionless normal coordinate $Y = 2y/d_j$
PSI	Stream function Ψ, lbm/ft^3
UD	Dimensionless velocity, $U = u/u_j$
THD	Dimensionless temperature, $\theta = T/T_j$
TI	Turbulence intensity, u'/u_j
TTD	Dimensionless temperature coefficient, $(T_T - T_{ex})/(T_{Tj} - T_{ex})$
PTD	Dimensionless pressure coefficient $(P_T - P_{ex})/(P_{Tj} - P_{ex})$
MACH	Mach number
V	Velocity (u), fps
T	Static temperature (T), ° R
TOT	Total temperature (T_T), ° R
PTOT	Total pressure (P_T), psia
(constituent) (DIFF=T)	Species mole fractions; the headings of the columns refer to the CNAME input parameters.

Jet Dimensionless Station Data (Summary)

Point Heading	Description
X	Dimensionless axial coordinate, $X = x/dj$
B	Dimensionless width of mixing zone Potential core - $(Y_e - Y_{u \neq u_j})$ Transition/similar - $(2Y_e)$
YJ	Dimensionless edge of jet $Y_e = 2y_e/d_j$
UC	Dimensionless velocity along $\psi = 0$
TC	Dimensionless temperature along $\psi = 0$
TIC	Turbulence intensity along $\psi = 0$
PTC	Dimensionless pressure coefficient along $\psi = 0$
TTC	Dimensionless temperature coefficient along $\psi = 0$
YSONIC	Dimensionless location of sonic line (if present)
WJ	Entrained flow ratio, (mass flow/mass flow at jet discharge plane)

Continued Mixer Station Data - Summary (MIX = T)

Print Heading	Description
XD	Axial coordinate, in.
RD	Outer boundary normal coordinate, in.
YCB	Inner boundary normal coordinate, in.
YD	Dimensionless equivalent of RD
YCD	Iterated dimensionless location of outer boundary
PD	Iterated static pressure, psia.
FLOW	Flow conditions at a given station SUBSON - Subsonic SUPSON - Supersonic CHOKED - Choked

Continued Mixer Station Data - Summary (MIX = T) (Concluded)

Print Heading	Description
THRUST	Integrated momentum, lbf.
MA2	Mach number external to the jet.
VE2	Velocity external to the jet.
TE2	Static temperature external to jet.

3.3 SSFD PROGRAM OUTPUT

The output from the SSFD program consists of dimensionless profiles of aerodynamic properties at the stations designated in JETMIX, as well as information on the location and strength of shocks at each calculation station. The calculated output variables are summarized as follows:

Print Heading	Description
X/R	x/r_j
Y	y/r_j
Mach Number	M
Flow Angle	v/u (actually the tangent of flow angle)
Total Pressure	p_t/p_{t_j}
Static Pressure	p_s/p_{t_j}
Density	ρ/ρ_{t_j} ρ_{t_j} is density based on P_t and T_t
U - Velocity	$u\sqrt{\gamma}/a_{t_j}$ (a_t is sonic velocity based on T_t)
Shock Angle	$\Delta y/\Delta x$ (actually the tangent of shock angle)
Turbulence Intensity	u'/u_j
XSHOCK	x/r_j
YSHOCK	y/r_j at shock
P2	P_s/P_{tj} downstream of shock
P1	P_s/P_{tj} upstream of shock
MACH2	M downstream of shock
MACH1	M upstream of shock

The subscript "j" has been used to denote exit-plane properties.

3.4 MERGE PROGRAM OUTPUT

The MERGE program is utilized to collate the aerodynamic output produced by the JETMIX and SSFD programs. The output produced by the MERGE program is similar to that of JETMIX and consists of the merged dimensionless profiles at the JETMIX output axial stations. The SSFD output is only available for those stations where the flow is nominally supersonic. Downstream of this point, the printed profiles consist of only the JETMIX data. The collated variables in their literal order of appearance in the printout are as follows:

Print Heading	Description
Y	Dimensionless normal coordinate, $Y = 2y/d_j$
PSI	Stream function ψ, lbm/ft^3
UD	Dimensionless velocity, $u = u/u_j$
THD	Dimensionless temperature, $\theta = T/T_j$
ED	Dimensionless turbulence energy, $E = e/e_j$
RHO	Density, lbm/ft^3
XLN	Turbulence length scale, ft.

3.5 NOISE PROGRAM OUTPUT

The main output for the NOISE Program consists of the following categories: One-Third Octave Band Analysis, Acoustic Summary of the Aerodynamic and Acoustic Parameters, and the acoustic Power Summary.

3.5.1 One-Third Octave Band Analysis

The one-third octave band analysis consists of two parts; a tabulated list of 1/3 OBSPL's and a computer plot of the same data. The calculated output variables are summarized as follows:

Print Heading	Description
X/D	Axial location of microphone in rectangular coordinates (in diameters)
Y/D	Cross-stream location of microphone in rectangular Coordinate system (in diameters)
R/D	Radial location of microphone location in R,θ polar coordinate system (in diameters)

Print Heading	Description
ANGLE	Polar angle (θ) from jet axis to microphone location (degrees)
CENTER FREQ, Hz	The center one-third octave band frequency (Hz)
LOWER FREQ, Hz	The lower limit for the one-third octave band
UPPER FREQ, Hz	The upper limit for the one-third octave band
NPTS	The number of volume elements used in performing the prediction of a 1/3 octave band
SPL	The one-third octave band sound pressure level prediction

3.5.2 Summary Acoustic Analysis

The summary acoustic analysis for the NOISE Program consists of a summary of the aerodynamic parameters and the far-field noise parameters. The output variables are summarized as follows:

Print Heading	Description
TE	Ambient static temperature, ° R
PE	Ambient static pressure, psia
VE	External velocity, fps
ME	External Mach number
TIE	External turbulence intensity
DIAJ	Diameter of jet, in.
MJET	Primary jet Mach number
TJET	Primary jet static temperature, ° R
PTJET	Primary jet stagnation pressure, psia
VJET	Primary jet velocity, fps
TIJET	Primary jet turbulence intensity
GAM	Ratio of specific heats
RG	Universal gas constant, ft lbf/lbm ° R
PR	Prandtl number
PRT	Turbulent Prandtl number
SC	Sutherland constant, ° R
TREF	Reference temperature, ° R

Print Heading	Description
MUREF	Reference viscosity, lbm/ft sec
N	Microphone number
ANGLE	Microphone angle location, degrees
OASPL	Overall sound pressure level, dB
SOUND PRES.	Acoustic sound pressure, $dynes/cm^2$
PNdB	Perceived noise level, dB
OBSPL	Included in the acoustic summary are octave band sound pressure level predictions

3.5.3 Summary Acoustic Power Analysis

The acoustic power analysis consists of an overall power level prediction, power per unit length of jet slice, and a 1/3 OBPWL prediction. The output variables are summarized as follows:

Parameter	Description
PWL	Overall power level (re:10^{-13} watts) per unit length of jet, radiating from station X
X	Axial station in jet diameters
CENTER FREQ, Hz	The center one-third octave band frequency (Hz)
LOWER FREQ, Hz	The lower limit for the one-third octave band (Hz)
UPPER FREQ, Hz	The upper limit for the one-third octave band (Hz)
NPTS	The number of volume elements used in constructing the prediction
POWER	The one-third octave band power spectra re 10^{-13} watts

3.6 SAMPLE CASE

The input/output for the Supersonic Jet Noise Prediction System (SSNOISE) is best illustrated with a sample case. The sample case is included in Appendix 10. The first page of Appendix 10 shows typical card input of JETMIX, SSFD, MERGE, and NOISE. This particular case was run in series as one job.

Following the requisite header cards and the program card, the essential input to JETMIX consists of the following items, describing the flow conditions at the discharge plane of the jet and the external boundary conditions:

Axisymmetric - Isothermal - Single Jet

Jet diameter	4.3 in.
Jet Mach no.	1.559 (supersonic)
Jet temperature	518.7° R
Jet turbulence intensity	0.1
Ambient pressure	14.696 psia
Ambient static temperature	518.7° R
Ambient Mach no.	0
Ambient turbulence intensity	0

The definition of jet temperature equal to ambient temperature causes the JETMIX program to bypass the solution of the energy equation and to calculate an isothermal flow field. Note that no station input (X, XPRN) was supplied for this case. As discussed in the Input section, a set of optimized acoustic stations are built in and used if station input is not given. These 72 stations are as follows:

X	XPRN	X	XPRN	X	XPRN	X	XPRN
0	1	.10	1	2.0	1	14.0	-1
.0001	-1	.12	-1	2.5	1	15.0	1
.0002	-1	.20	1	3.0	-1	16.0	-1
.0003	-1	.25	-1	3.4	1	17.0	-1
.0005	-1	.30	1	4.0	-1	18.0	-1
.0008	-1	.34	-1	5.0	1	19.0	-1
.001	-1	.40	1	6.0	-1	20.0	1
.002	-1	.45	-1	6.2	1	21.0	1
.004	-1	.50	1	6.5	-1	22.0	-1
.006	-1	.55	-1	6.8	-1	23.0	-1
.008	-1	.60	-1	7.0	-1	24.0	-1
.010	1	.65	-1	7.5	1	25.0	-1
.015	-1	.70	1	8.0	-1	26.0	-1
.017	-1	.80	-1	9.0	1	28.0	-1

X	XPRN	X	XPRN	X	XPRN	X	XPRN
.02	1	1.0	1	10.0	-1	30.0	-1
.04	1	1.2	-1	11.0	1	32.0	1
.06	1	1.5	-1	12.0	-1	34.0	-1
.08	-1	1.7	-1	13.0	1	36.0	-1

The input of CXTP = 0.04 was utilized to speed the calculation in the transition/similar region downstream of the point where the potential core disappears.

The program output of JETMIX is given on pages 672 to 719 and consists of the initial conditions at the discharge plane of the jet, the calculated aerodynamic profiles at the stations where XPRN = 1, and the final summary page with calculated station data and the overall jet properties. Referring to the summary page, it will be noted that stations have been inserted where the potential core disappears (X = 4.12861) and where the supersonic core disappears (X = 12.12730). The corresponding profile output at these stations is also printed. The output parameter headings are described in Section 3.2.

The input to SSFD consists of the following items:

Initial jet Mach number (XMACH)	1.05
Stability parameter (STABIL)	0.6
Final x/dj for calculation (XL)	1.7

This case corresponds to an underexpanded jet (recall that the fully expanded "ideal" Mach number input to JETMIX was 1.559). The inputs of STABIL = 0.6 and XL = 1.7 were utilized to speed the calculation by increasing the axial step size and decreasing the distance over which the calculation is performed, respectively.

The program output for SSFD is shown on page 721. The output parameters and headings are described in Section 3.3. Radial profiles are given at each of the axial stations for which XPRN was specified as +1 or -1 in JETMIX, and for which x/dj < XL. In addition, the progression of shocks through the flowfield is monitored at intermediate axial stations.

The input to the MERGE program consists of a single card designating the MERGE program, with both a file input (file 2) and a file output (file 3). The output from the MERGE program consists of composite (JETMIX and SSFD) profiles at each of the JETMIX stations where XPRN ≠ 0. The MERGE output is shown on page 766 . The output parameter headings are described in Section 3.4.

For the NOISE predictions, two cases were computed using a Lighthill model modified for a combination of self-noise and shear-noise (see pages 813 to 847). The first case is for a prediction using JETMIX results as input

data alone, the second case is for a prediction using MERGE results as input (no-shock case versus a shock-flow case). The predictions are for a model scale jet on a 40-foot arc. The program output is seen to consist of 1/3 OBSPL summaries at jet angles of 10, 20, 30, 150, and 160°. This is followed by an overall summary page of the basic aerodynamic parameters and the far-field noise OASPL, PNdB, and OBSPL; and a summary page for the predicted jet power per unit slice, OAPWL, and power spectra. Section 2.5 describes the output parameters.

As an example test case for near-field noise predictions, see the last test case run in Appendix 10 (pages 848-901). There the lateral quadrapole near-field acoustic model is shown. This test case, with the instructions given in Appendix 9 - Input Sheets - should suffice as an example for running any of the other near-field models.

4.0 OPERATING PROCEDURES

4.1 GENERAL DESCRIPTION

The SSNOISE system described herein may be run on any Control Data 6400/6600 machine operating under SCOPE 3.0 or a higher level operating system. In general, operating procedures and control card setups will differ from site to site. The following comments on program modifications, deck setups, and operating instructions are restricted to the program as run through the CDC Cybernet System. Minimal changes should be necessary for successful installation at other CDC sites.

4.2 MAINTENANCE AND MODIFICATION

The SSNOISE system source deck consists of approximately 14,000 FORTRAN cards. The source copy contains *DECK cards as the first card of each subroutine. These decks (tape) may be used directly to initialize an UPDATE file (tape or permanent disc) which may subsequently be used for maintenance and modification (standard SCOPE - UPDATE program). It is recommended that relocatable and absolute binary files also be maintained either on tape or permanent disc. Execution from the absolute binary file requires a central memory field length of 103000_8 locations. A typical deck setup for execution from an absolute binary file through CDC Cybernet System is as follows:

RFL (40000)

LABEL (SSNOV, R, VSN = S2222)

COPYBF (SSNOV, SSNOISE)

REWIND (SSNOISE)

COPYBF (INPUT, TAPE5)

RFL (103000)

SET (0)

SSNOISE

67_8 (EOR)

[Input Data]

678_9 (EOF)

4.3 INPUT AND OUTPUT FILES

As mentioned previously, each program, with the exception of NOISE program produces an output file which may be used as input to the other programs in the SSNOISE system. The files and their functional use are repeated here for convenience.

File	Device	Functional Usage
TAPE1	tape	JETMIX restart file
TAPE2	tape/disc	JETMIX output file Input file to SSFD, MERGE, NOISE
TAPE3	tape/disc	SSFD output file Input file to MERGE
TAPE4	tape/disc	MERGE output file Input file to NOISE

In a given run, if the file is not assigned via an appropriate tape card (REQUEST, LABEL), the file will be automatically assigned to disc when it is opened. The output file from JETMIX, SSFD, or MERGE may be saved on tape and used as input in a subsequent job. If the aerodynamic configuration does not change, it is economically feasible to run the aero program(s) once and save an output tape. The resulting file may then be used as input for parametric running of the NOISE program. In this case, there is no need to rerun the aero program(s) with each NOISE case.

The following schematic input deck setups illustrate the flexibility available to the user:

1) Execution of all programs in SSNOISE system. NOISE executed using both the JETMIX file and the MERGE file.

```
[Control card stack]
(EOR)
2
NAME = ____________________________________________
ADDRES = __________________________________________
IDENT = ___________________________________________
JETMIX    F    T
$A
          (JETMIX input)
$
SSFD      T    T
$INPUT
          (SSFD input)
$
MERGE     T    T
NOISE     T    F
$A
          (NOISE input - JETMIX output file)
$
NOISE     T    F
$A
MFILE = 4,  (NOISE input - MERGE output file)
$
(EOF)
```

2) Execution of JETMIX - Save output file on tape

```
 Control card stack
 LABEL (TAPE2, W, X, = SV, LABEL = JETMIX)
(EOR)
2
NAME = _____________________________________
ADDRES = ___________________________________
IDENT = ____________________________________
```

```
JETMIX     F    T
$A
           (JETMIX input)
$
(EOF)
```

3) Execution of SSFD and MERGE using previously saved JETMIX output tape. Save MERGE output file on tape.

```
Control card stack
LABEL (TAPE2, R, VSN = S1111)
LABEL (TAPE4, X=SV, LABEL = MERGE)
(EOR)
```

▽2

```
NAME = ______________________________________
ADDRES = ____________________________________
IDENT = _____________________________________
SSFD       T    T
$INPUT
     (SSFD input)
$
MERGE      T    T
(EOF)
```

APPENDIX 6

ANALYSIS INCORPORATED IN JETMIX

Exhaust nozzles of contemporary gas turbine engines generally operate near their ideal expansion ratios. In view of this, General Electric's initial efforts at the prediction of the sound field of a supersonic jet relied on an aerodynamic analysis which includes only the effects of turbulent mixing. Specifically, the aerodynamic model is of the viscous, boundary-layer type. In this analysis, which is incorporated in the JETMIX computer program, the time-averaged turbulent boundary layer equations are solved using boundary conditions which are appropriate for free jets. The turbulent Reynold's stresses are included by means of a turbulence model which is based on a turbulent kinetic energy concept.

The flow field under consideration consists of a plane or axisymmetric turbulent jet exhausting into a region of constant (ambient) static pressure. This is illustrated schematically in Figures 249 and 250 for subsonic and supersonic jets, respectively. The flow of diameter or slot height (d_p) discharges at an initial velocity (u_p) into a free stream of velocity (u_{ex}). The flow field is characterized by three distinct regions. Region 1 consists of a turbulent mixing layer which penetrates into the uniform parallel flow originating at the jet discharge. Upon disappearance of the potential core, the mixing characteristics undergo transition (Region 2), until, at some distance downstream of the discharge plane, the velocity profiles normal to the jet axis become similar (Region 3).

The dependent variables of interest in the mixing problem are the streamwise velocity (u), the transverse velocity (v), the static temperature (T), the turbulence energy (e), and the constituent mole fractions (α_i). If transverse gradients are large with respect to streamwise gradients, the equations of motion describing the flow field may be reduced to boundary layer form. For plane or axisymmetric flow, the governing boundary layer equations applicable to the free-mixing problem are:

CONTINUITY EQUATION

$$\frac{\partial(\rho u y^{\varepsilon})}{\partial x} + \frac{\partial[(\rho v + \langle\rho' v'\rangle) y^{\varepsilon}]}{\partial y} = 0 \qquad (232)$$

$$\varepsilon = \begin{cases} 0 & \text{Plane (2-0) flow} \\ 1 & \text{axisymmetric flow} \end{cases}$$

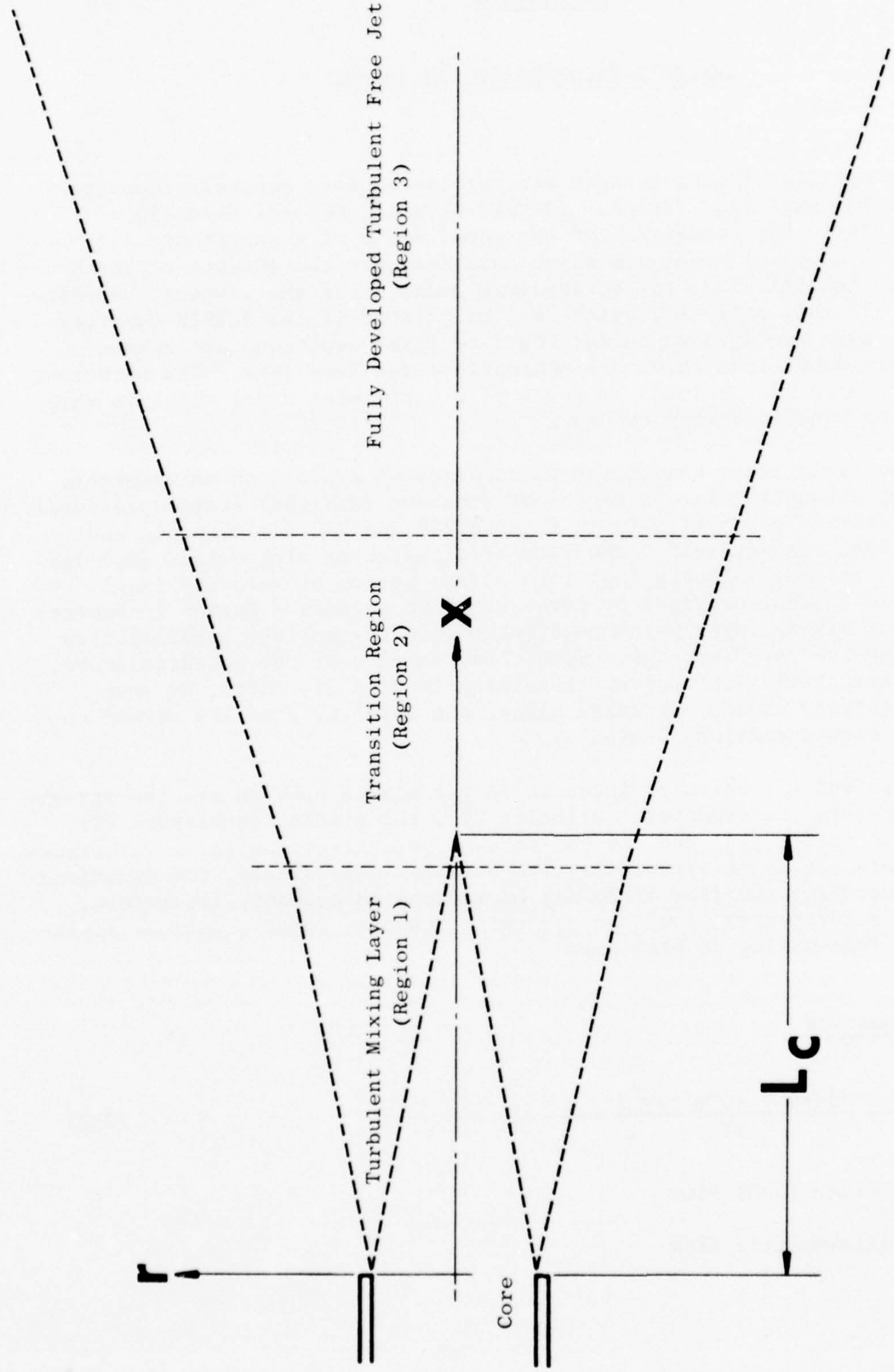


Figure 249. Subsonic Turbulent Jet.

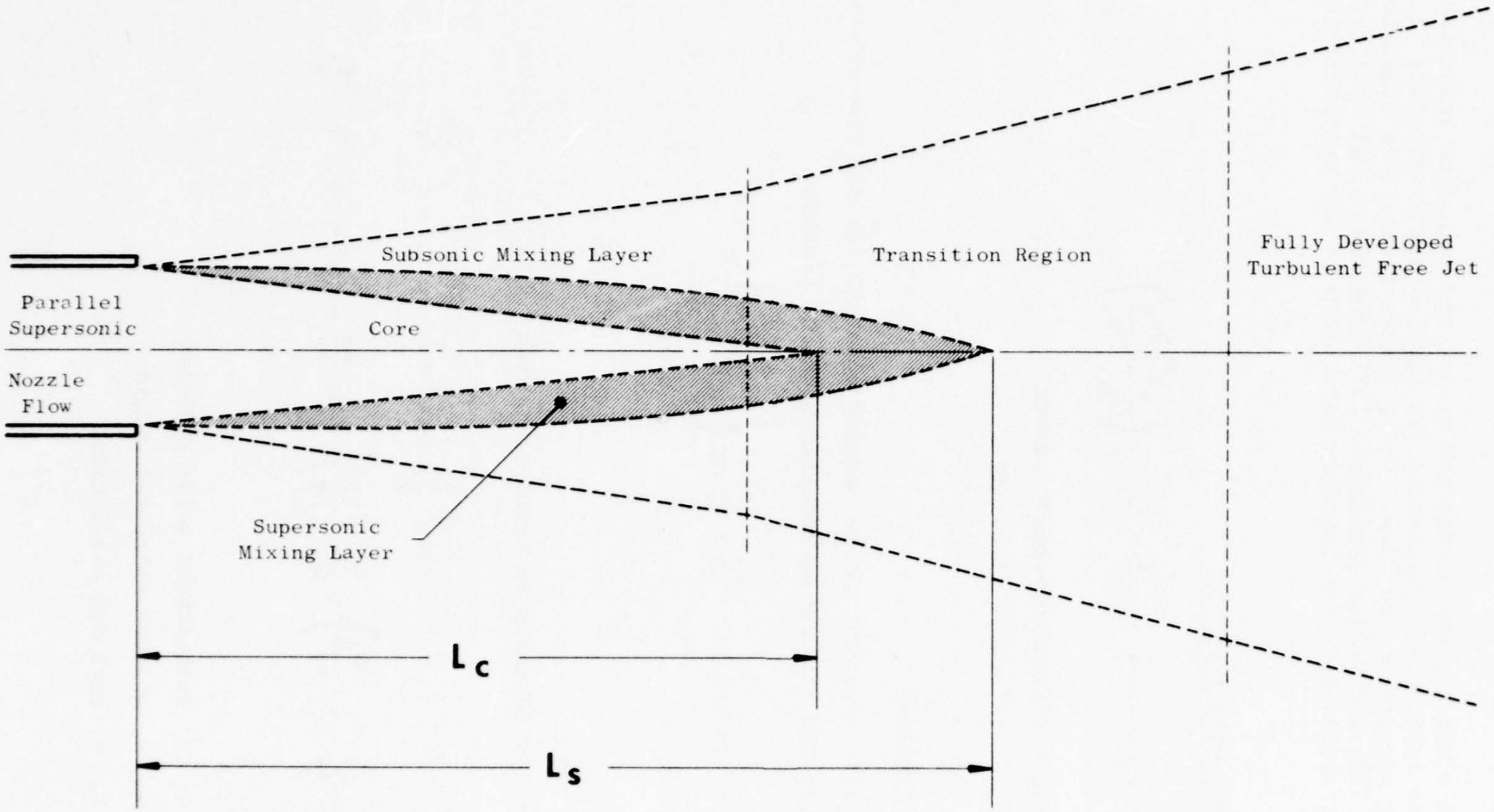


Figure 250. Supersonic Turbulent Jet.

where u and v are the streamwise and transverse mean flow velocities, respectively. The term $\langle \rho' v' \rangle$ represents the induced transverse mass flux of the fluctuating portion of the flow. Using order-of-magnitude arguments, Bradshaw (Reference 157) and Mellor (Reference 158) have shown that this term should be properly retained in the boundary layer form of the compressible equations of motion.

SPECIES CONTINUITY EQUATION

$$\rho u \frac{\partial \alpha_i}{\partial x} + (\rho v + \langle \rho' v' \rangle \frac{\partial \alpha_i}{\partial y} = \frac{1}{y^{\varepsilon}} \frac{\partial}{\partial y} \left(\frac{\mu_e y^{\varepsilon}}{S_{ie}} \frac{\partial \alpha_i}{\partial y} \right) \tag{233}$$

where: S_{ie} = effective Schmidt number

μ_e = effective viscosity

X-MOMENTUM EQUATION

The static pressure may be assumed constant for the free-mixing analysis. In this case, the streamwise momentum equation becomes:

$$\rho u \frac{\partial u}{\partial x} + (\rho v + \langle \rho' v' \rangle \frac{\partial u}{\partial y} = \frac{1}{y^{\varepsilon}} \frac{\partial}{\partial y} \left(\mu_e \, y^{\varepsilon} \frac{\partial u}{\partial y} \right) \tag{234}$$

ENERGY EQUATION

The energy equation in terms of enthalpy is:

$$\begin{aligned} \rho u \frac{\partial h}{\partial x} + (\rho v + \langle \rho' v' \rangle) \frac{\partial h}{\partial y} = \frac{1}{y^{\varepsilon}} \frac{\partial}{\partial y} \Bigg((k_e \, y^{\varepsilon} \frac{\partial T}{\partial y} + \Gamma_e \, y^{\varepsilon} \frac{\partial e}{\partial y} \\ + \frac{\mu_{\varepsilon} y^{\varepsilon}}{\overline{M}} \sum_i \frac{h_i}{S_{ie}} \frac{\partial \alpha_i}{\partial y} \Bigg) + \frac{\mu_e}{g_c J} \left(\frac{\partial u}{\partial y} \right)^2 - \rho u \frac{\partial e}{\partial x} - (\rho v + \langle \rho' v' \rangle) \frac{\partial e}{\partial y} \end{aligned} \tag{235}$$

where: h_i = constituent molar enthalpy

$\overline{M}$ = mixture molecular weight

Γ_e = exchange coefficient

The static enthalpy of the mixture may be eliminated as an independent variable by using the following definitions:

$$h = \frac{1}{\bar{M}} \sum_i \alpha_i \; h_i \tag{236}$$

$$C_p = \frac{1}{\bar{M}} \sum_i \alpha_i \; C_{pi} \tag{237}$$

Differentiating,

$$\frac{\partial h}{\partial x} = \frac{1}{\bar{M}} \sum_i \alpha_i \frac{\partial h_i}{\partial x} + \frac{1}{\bar{M}} \sum_i h_i \frac{\partial \alpha_i}{\partial x}$$

$$\frac{\partial h}{\partial y} = \frac{1}{\bar{M}} \sum_i \alpha_i \frac{\partial h_i}{\partial y} + \frac{1}{\bar{M}} \sum_i h_i \frac{\partial \alpha_i}{\partial y}$$

Using equation 236 and the species continuity equation, equation 233 yields the energy equation in terms of the mixture C_p and the static temperature (T).

$$\begin{aligned} \rho u \; C_p \frac{\partial T}{\partial x} + (\rho v + \langle\rho' v'\rangle) \; C_p \frac{\partial T}{\partial y} &= \frac{1}{y^\varepsilon} \frac{\partial}{\partial y}\left(k_e \; y^\varepsilon \frac{\partial T}{\partial y}\right) \\ &+ \frac{1}{y^\varepsilon} \frac{\partial}{\partial y}\left(\Gamma_e \; y^\varepsilon \frac{\partial e}{\partial y}\right) + \frac{\mu_e}{\bar{M}} \sum_i \frac{C_{pi}}{S_{ie}} \frac{\partial \alpha_i}{\partial y}\left(\frac{\partial T}{\partial y}\right) + \frac{\mu_e}{g_c J}\left(\frac{\partial u}{\partial y}\right)^2 \\ &- \rho u \frac{\partial e}{\partial x} - (\rho v + \langle\rho' v'\rangle) \frac{\partial e}{\partial y} \end{aligned} \tag{238}$$

The pressure, density, and temperature which appear in the above equations are related to each other by means of the perfect gas law:

$$P = \rho RT \tag{239}$$

where: R = mean gas constant for mixture.

The mean mixture heat capacity is considered to be a function of the static temperature T. For constant R then, C_p may be related to the isentropic exponent γ as:

$$C_p = \frac{\gamma R}{\gamma - 1} \quad (240)$$

Specification of γ as a function of temperature then enables calculation of C_p.

The Prandtl/Glushko/Spalding model which is discussed in the following section has been incorporated into equations 233, 234, and 238.

VISCOSITY MODEL

Introduction of an eddy viscosity (μ_e) permits expression of the local shear stress in terms of an effective viscosity and the mean flow velocity gradient:

$$\tau = \tau_L + \tau_t = \mu \left(\frac{\partial u}{\partial y} \right) - \langle (\rho v)' u' \rangle \quad (241)$$

$$\tau = (\mu + \mu_t) \frac{\partial u}{\partial y} = \mu_e \frac{\partial u}{\partial y} \quad (242)$$

Phenomenological models, such as the Prandtl mixing length (Reference 114) have been used to relate the "eddy" or "turbulent" viscosity (μ_t) to the local mean velocity field. These models imply that the turbulence adjusts immediately to changes in mean flow conditions and that a universal relationship exists between the turbulent stresses and the mean strain rates. Experimental data have indicated that there is a delayed response of the turbulence structure to sudden changes in mean conditions. The turbulent kinetic energy equation proposed by Prandtl (Reference 114), and utilized by Glushko (Reference 4) and Spalding (Reference 118), provides a more fundamental modeling of the "eddy" viscosity. In the present work, the Prandtl-Kolmogorov relations, as given by Glushko and Spalding, are used to relate the "eddy" viscosity to the mean flow quantities. After Kolmogorov (Reference 115), the turbulent shear stress is taken as a universal function of the Reynolds number of turbulence:

$$\tau_t = \mu \alpha R_t \left(\frac{\partial u}{\partial y} \right) = \mu_t \left(\frac{\partial u}{\partial y} \right) \quad (243)$$

where α = Constant = 0.2

R_t = Reynolds number of turbulence = $\dfrac{\rho \sqrt{e}\, L_T}{\mu}$

e = Turbulent kinetic energy

L_t = Length scale characterizing turbulence

The "effective" viscosity is defined as the sum of the laminar and turbulent parts:

$$\mu_e = \mu + \mu_t = \mu\, (1 + \alpha R_t) \quad (244)$$

Defining a turbulent Prandtl number as $Pr_t = \frac{C_p \mu_t}{k_t}$, the "effective" thermal conductivity is given as:

$$k_e = C_p \, \mu \left[\frac{1}{Pr} + \left(\frac{\mu_t}{\mu} \right) \frac{1}{Pr_t} \right] \tag{245}$$

The above relations introduce the turbulent kinetic energy as an additional dependent variable. The boundary layer equations cited previously may be augmented by an additional partial differential equation describing the conservation of turbulent kinetic energy. Specification or calculation of the characteristic length scale (L_t) then provides closure of the system of equations.

TURBULENT KINETIC ENERGY

The turbulent kinetic energy equation, discussed in Hinze (Reference 149), represents the balance between the advection, diffusion, production, and dissipation of turbulent kinetic energy. In the Prandtl/Glushko model (References 114 and 4), the pressure-velocity correlation term and triple velocity correlation term arising in the development of the turbulence energy equation are combined as a "gradient diffusion" term. The resulting turbulent kinetic energy equation is:

$$\rho u \frac{\partial e}{\partial x} + (\rho v + \langle \rho' v' \rangle) \frac{\partial e}{\partial y} = \frac{1}{y^{\varepsilon}} \frac{\partial}{\partial y} \left(\Gamma_e \, y^{\varepsilon} \frac{\partial e}{\partial y} \right) + \mu_t \left(\frac{\partial u}{\partial y} \right)^2 - D_e \tag{246}$$

In modeling the dissipation term (D_e), it is assumed that the small-scale eddies responsible for the dissipation of mechanical energy are capable of handling all the energy transferred to them by the larger scale motion. The process is then assumed to be diffusion controlled, and both the exchange coefficient (Γ_e) and the dissipation term (D_e) are expressed in terms of an "intravortex" turbulent viscosity (D):

$$\Gamma_e = \mu D \tag{247}$$

$$D_e = \frac{(C\mu D) e}{L_t^2} \tag{248}$$

The coefficient, D, is given by Glushko and Spalding as:

$$D = 1 + \alpha \eta \, R_t \tag{249}$$

where:

η = Constant = 0.586 (after Spalding)

The constant (C) in the dissipation term of the turbulence energy equation is assigned the value 2.59 (Spalding) for application to the turbulent mixing problem.

The principal uncertainty in the turbulence model resides in the characteristic length scale assigned to the turbulence (L_t). A partial differential equation for L_t, similar to the turbulence energy equation 246, has been derived by Rotta (Reference 3). In the present analysis, however, the characteristic scale of the jet turbulence is assumed independent of the transverse coordinate (y), and is expressed in terms of the geometric parameters of the jet. Experimental data are used to define the constants in the model.

Referring to Figure 249, the mixing region of the single jet may be divided into three distinct zones. In zone 1, the flow consists of a mixing layer which penetrates into the uniform parallel flow emanating from the jet discharge. The turbulence scale in this region is assumed proportional to the width of the mixing layer:

$$L_{t(1)} = \frac{C_{t1}\, b}{1 + C_{t2}\, M_J} \tag{250}$$

where: b = Width of mixing layer

M_J = Jet discharge Mach number

C_{t1}, C_{t2} = Empirical constants

The above relationship, along with empirical values for C_{t1} and C_{t2}, is developed in References 49 and 159 where comparisons with experimental data are given.

In Zone 3, the velocity profiles are known to be similar. The turbulent scale for this fully developed region is defined, after Spalding (Reference 118), to be proportional to local radius or half-height of the jet (Y_J).

$$L_{t(3)} = C_{t8}\, Y_J \tag{251}$$

The turbulence length scale in the transition zone (Region 2) is less well defined than those in Regions 1 and 3, in that experimental data are sparse or nonexistent. Two models are available for this region. In the first, an exponential increase in length scale is assumed to occur upon disappearance of the potential core:

$$L_{t(2)} = \frac{C_{t3} Y_J}{1 + C_{t5} M_J} \left(\frac{X}{L_c}\right)^{C_{t4}} (C_{t6} + C_{t7} M_J) \tag{252}$$

The end of the transition zone is calculated as the axial station at which $L_{t(2)}$ first becomes equal to or greater than $L_{t(3)}$. The constants in this model must be determined from experimental data.

The second model assumes that the length of the transition zone is equal to the length of the potential core (L_c), and that the length scale varies linearly from the end of the core to the beginning of the fully developed region:

$$L_{t(2)} = \frac{C_{t1} Y_J}{1 + C_{t2} M_J} \left(2 - \frac{X}{L_c}\right) + C_{t8} Y_J \left(\frac{X}{L_c} - 1\right) \tag{253}$$

Calculations based on this model generally have been found to show closer agreement with experimental data than those based on the model of equation (252).

The numerical values assigned to the constants C_{t1} thru C_{t8} are:

C_{t1}	=	0.23	C_{t5}	=	0.38
C_{t2}	=	0.38	C_{t6}	=	1.4
C_{t3}	=	0.23	C_{t7}	=	0.43
C_{t4}	=	0.05	C_{t8}	=	0.1875

Using equations 247 and 248, the turbulent energy equation 246 may be rewritten as:

$$\rho u \frac{\partial e}{\partial x} + (\rho v + \langle \rho' v' \rangle) \frac{\partial e}{\partial y} = \frac{1}{y^{\varepsilon}} \frac{\partial}{\partial y} \left(\mu D y^{\varepsilon} \frac{\partial e}{\partial y}\right)$$

$$+ \mu_t \left(\frac{\partial u}{\partial y}\right)^2 - \frac{C \mu D_e}{L_t^2} \tag{254}$$

BOUNDARY CONDITIONS

Considering the jet to be symmetric about the line y = 0, the applicable boundary conditions are:

$$@\ y = 0 \qquad \frac{\partial u}{\partial y} = \frac{\partial e}{\partial y} = \frac{\partial T}{\partial y} = \frac{\partial \alpha_i}{\partial y} = 0 \tag{255}$$

$$@\ y = y_{ex} \qquad \begin{aligned} u &= u_{ex} \\ T &= T_{ex} \\ e &= e_{ex} \\ \alpha_i &= \alpha_{iex} \end{aligned}$$

TRANSFORMATION OF DIFFERENTIAL EQUATIONS

The preceding equations may be cast in a more convenient form by non-dimensionalizing with respect to the primary jet diameter and the discharge flow field variables u_p, e_p, T_p. The requisite relations are:

$$\begin{aligned} &X = \frac{x}{d_p}\ , \quad Y = \frac{2y}{d_p} \\ &U = \frac{u}{u_p}\ , \quad V = \frac{v}{u_p}\ , \quad V' = \frac{v'}{u_p} \\ &E = \frac{e}{e_p}\ , \quad \theta = \frac{T}{T_p} \end{aligned} \tag{256}$$

Substitution in equations 232 through 235 and equation 254 yields:

Continuity

$$\frac{\partial(\rho U Y^{\varepsilon})}{\partial X} + 2\frac{\partial}{\partial Y}\left[(\rho V + \langle\rho' V'\rangle)\ Y^{\varepsilon}\right] = 0 \tag{257}$$

X-Momentum

$$\rho U \frac{\partial U}{\partial X} + 2\,(\rho V + \langle \rho' V' \rangle)\,\frac{\partial U}{\partial Y} = \left(\frac{4}{u_p d_p Y^{\varepsilon}}\right)\frac{\partial}{\partial Y}\left(\mu_e\, Y^{\varepsilon}\,\frac{\partial U}{\partial Y}\right) \tag{258}$$

Turbulent Kinetic Energy

$$\rho U \frac{\partial E}{\partial X} + 2\,(\rho V + \langle \rho' V' \rangle)\,\frac{\partial E}{\partial Y} = \left(\frac{4}{u_p d_p Y^{\varepsilon}}\right)\frac{\partial}{\partial Y}\left(\mu D Y^{\varepsilon}\,\frac{\partial E}{\partial Y}\right) + \left(\frac{4u_p}{g_c J d_p e_p}\right)\mu_t\left(\frac{\partial U}{\partial Y}\right)^2 - \frac{\mu C d_p E}{u_p L_t^2} \tag{259}$$

Species Continuity

$$\rho U \frac{\partial \alpha_i}{\partial X} + 2\,(\rho V + \langle \rho' V' \rangle)\,\frac{\partial \alpha_i}{\partial Y} = \left(\frac{4}{u_p d_p Y^{\varepsilon}}\right)\frac{\partial}{\partial Y}\left(\frac{\mu_e Y^{\varepsilon}}{S_{ie}}\,\frac{\partial \alpha_i}{\partial Y}\right) \tag{260}$$

Energy

$$\begin{aligned}\rho U \frac{\partial \theta}{\partial X} + 2\,(\rho V + \langle \rho' V' \rangle)\,\frac{\partial \theta}{\partial Y} &= \left(\frac{4}{C_p u_p d_p Y^{\varepsilon}}\right)\frac{\partial}{\partial Y}\left(k_e\, Y^{\varepsilon}\,\frac{\partial \theta}{\partial Y}\right) \\ &+ \left(\frac{4e_p}{C_p u_p T_p d_p Y^{\varepsilon}}\right)\frac{\partial}{\partial Y}\left(\mu D Y^{\varepsilon}\,\frac{\partial E}{\partial Y}\right) \\ &+ \left(\frac{4\,u_p \mu_e}{C_p g_c J T_p d_p}\right)\left(\frac{\partial U}{\partial Y}\right)^2 + \left(\frac{4\mu_e}{u_p d_p \bar{M}}\right)\sum_i \frac{C_{pi}}{S_{ie}}\,\frac{\partial \alpha_i}{\partial Y}\left(\frac{\partial \theta}{\partial Y}\right) \\ &- \left(\frac{e_p}{C_p T_p}\right)\rho U\,\frac{\partial E}{\partial X} - \left(\frac{e_p}{C_p T_p}\right) 2\,(\rho V + \langle \rho' V' \rangle)\,\frac{\partial E}{\partial Y}\end{aligned} \tag{261}$$

The boundary conditions become:

$$@\ Y = 0 \qquad \frac{\partial U}{\partial Y} = \frac{\partial E}{\partial Y} = \frac{\partial \theta}{\partial Y} = \frac{\partial \alpha_i}{\partial Y} = 0$$

$$@\ Y \rightarrow Y_{ex} \qquad \begin{aligned} U &= U_{ex} \\ E &= E_{ex} \\ \theta &= \theta_{ex} \\ \alpha_i &= \alpha_{iex} \end{aligned} \tag{262}$$

The continuity equation 257 may be identically satisfied by introduction of the stream function coordinate (ψ) as one of the independent variables (Von Mises transformation). Define a modified stream function, satisfying continuity as follows:

$$\frac{\partial \psi}{\partial Y} = \frac{1}{2} \rho U Y^{\varepsilon} \ , \ \frac{\partial \psi}{\partial X} = - \left(\rho V + \langle \rho' V' \rangle\right) Y^{\varepsilon} \tag{263}$$

Using these relationships in equations 258 through 261 removes the transverse velocity components (V, V').

The system of nonlinear parabolic differential equations (257 through 261), along with boundary conditions and suitably prescribed initial conditions, represents a properly posed initial value problem. The solution may be stepwise advanced in the positive X direction using a finite difference approach. The implicit numerical technique utilized in the present investigation closely parallels that of Patankar and Spalding (Reference 160). The general programs of these latter investigators were not available at the inception of this project. The differences between the two approaches arise primarily in the type of finite difference mesh and the methods of controlling the streamwise step size.

The Patankar method uses a fixed dimensionless streamline grid. The stream-wise step size is controlled by explicitly monitoring the flow environment over a given step. In the present work, streamlines are added in a systematic fashion to cover the entire flow field. The streamwise step size is related to the local geometric parameters of the jet, such as the width of the mixing zone of the distance to the effective edge of the jet.

The partial differential equations are all of the general "diffusion equation" form:

$$\frac{\partial F}{\partial X} = \alpha \frac{\partial}{\partial \psi} \left(\beta \frac{\partial F}{\partial \psi} \right) + \gamma + \delta F + \eta \frac{\partial F}{\partial \psi} \tag{264}$$

where F may represent any of the independent variables (U, E, θ, α_i). The equations are coupled principally through the normal derivative terms. Hence, a sequential solution technique may be utilized, as opposed to direct simultaneous integration. The specific procedure consists of initially formulating the differential equations in terms of linear difference equations. The linearization is effected by evaluating the coefficients of the differential equations at the known upstream mesh points. The X-momentum equation is first solved for values of U and $\partial U/\partial \Psi$ at the downstream station. Using these quantities, the turbulent kinetic energy equation may be integrated to determine E and $\partial E/\partial \Psi$. Finally, the species continuity and energy equations may be solved using the results of the preceding two solutions.

VALIDATION OF MODEL BY COMPARISON WITH EXPERIMENTAL DATA

The JETMIX analysis has been compared with a wide spectrum of experimental data. The comparisons (some of which are shown here) have, in general, been very good. In particular, the JETMIX analysis has proven capable of accurately predicting the effects of changes in the external environment of the jet, including changes in the velocity, temperature, composition, and/or pressure of the external stream.

In Figures 251, 252, and 253, the measured cross-stream mean velocity profiles of Laurence (Reference 161) are compared with JETMIX predictions at each of three axial locations. A corresponding comparison for the turbulence intensity is shown in Figure 254. The excellent agreement between the JETMIX predictions and the experimental data for both the velocity profile comparisons indicates the potential of the JETMIX analysis as an exhaust-plume, flow-field prediction tool.

Comparisons between hot-jet test results and the free turbulent mixing analysis are given in Figure 255 through 258. These comparisons, which show the axial variation of the total temperature, the total pressure, the velocity, and the Mach number on the jet centerline, are again very good. These data were obtained at General Electric using a traversing water-cooled rake. The experimental setup consisted of an exhaust jet issuing from a conical nozzle at a pressure ratio of 3.2. The facility temperature was 2400° R. The actual rake data indicated that the nozzle was operating at a fully expanded Mach number, $M = 1.45$, and at a total temperature of 2550° R. These measured conditions in the supersonic core were used as the initial conditions for the mixing analysis predictions.

Additional comparisons between these same hot-jet test results and the JETMIX analysis are given in Figures 259 through 266. Figures 259 and 260 show typical radial profiles of total temperature at each of two axial locations. Figures 261 and 262 show the corresponding cross-stream velocity profiles, while Figures 263 and 264, and Figures 265 and 266, show the corresponding Mach number profiles and total-pressure profiles, respectively. It is emphasized that the empirical constants which were used in the turbulence

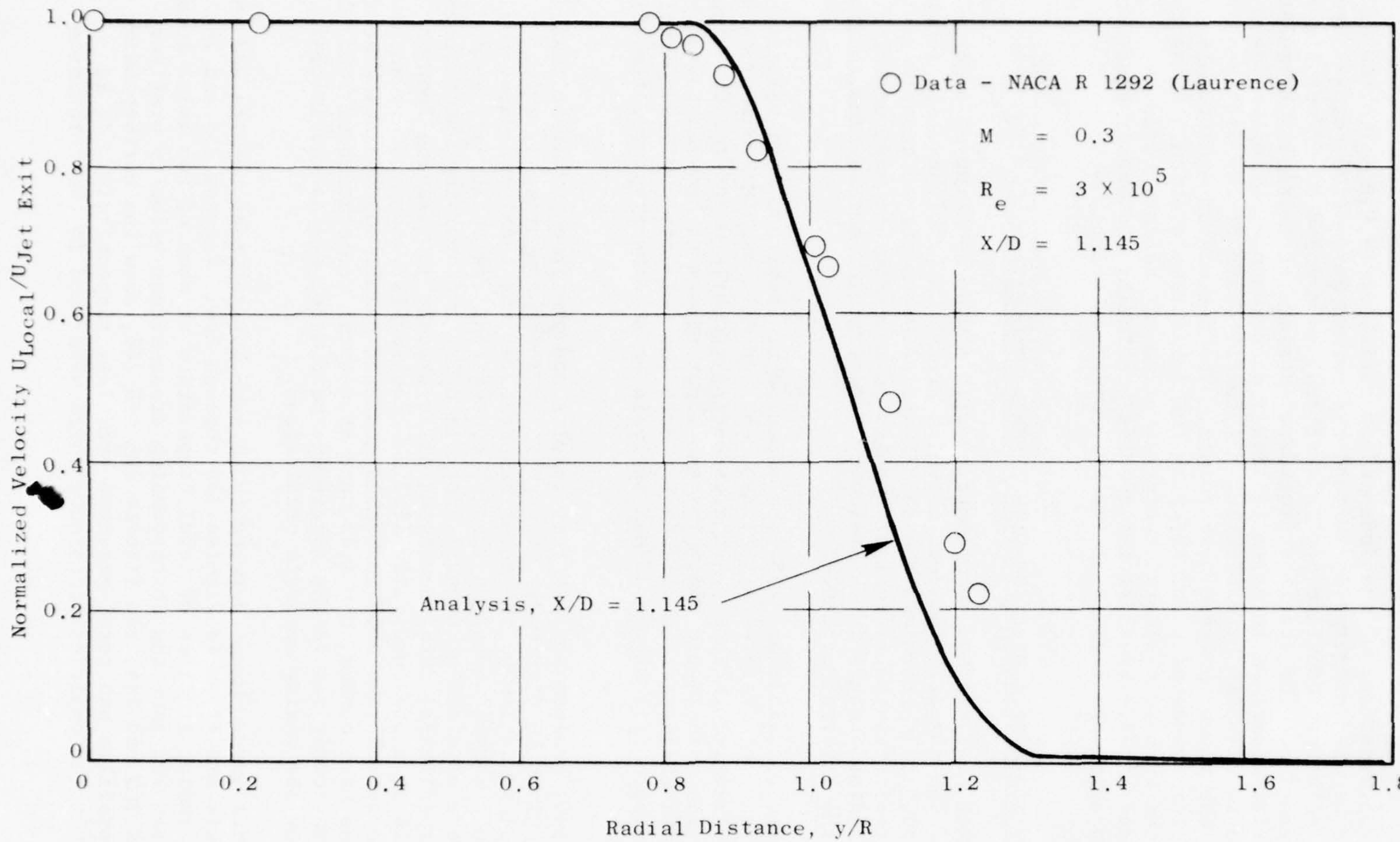


Figure 251. Jet Plume Predictions Free Turbulent Mixing Analysis.

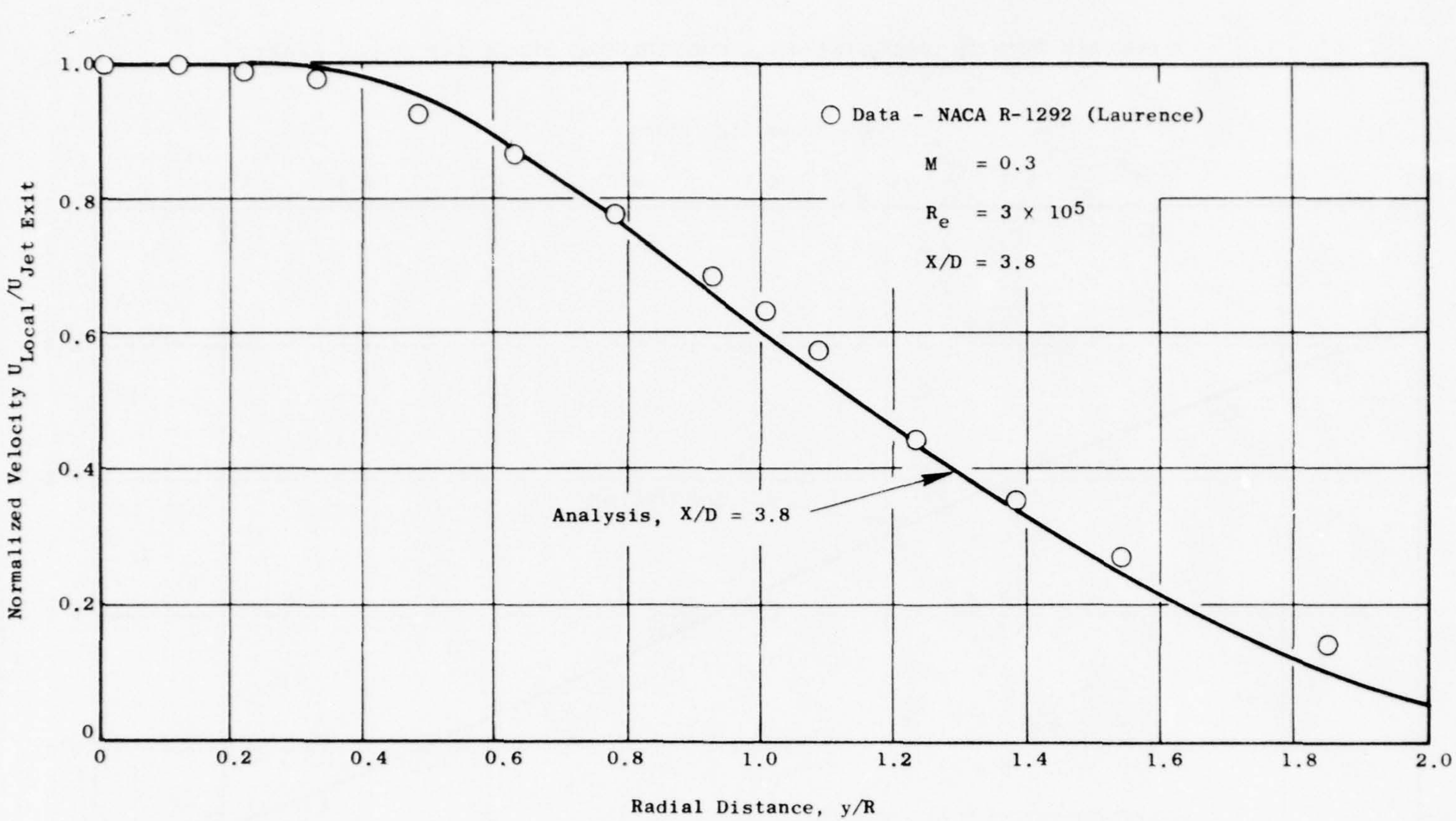


Figure 252. Jet Plume Predictions Free Turbulent Mixing Analysis.

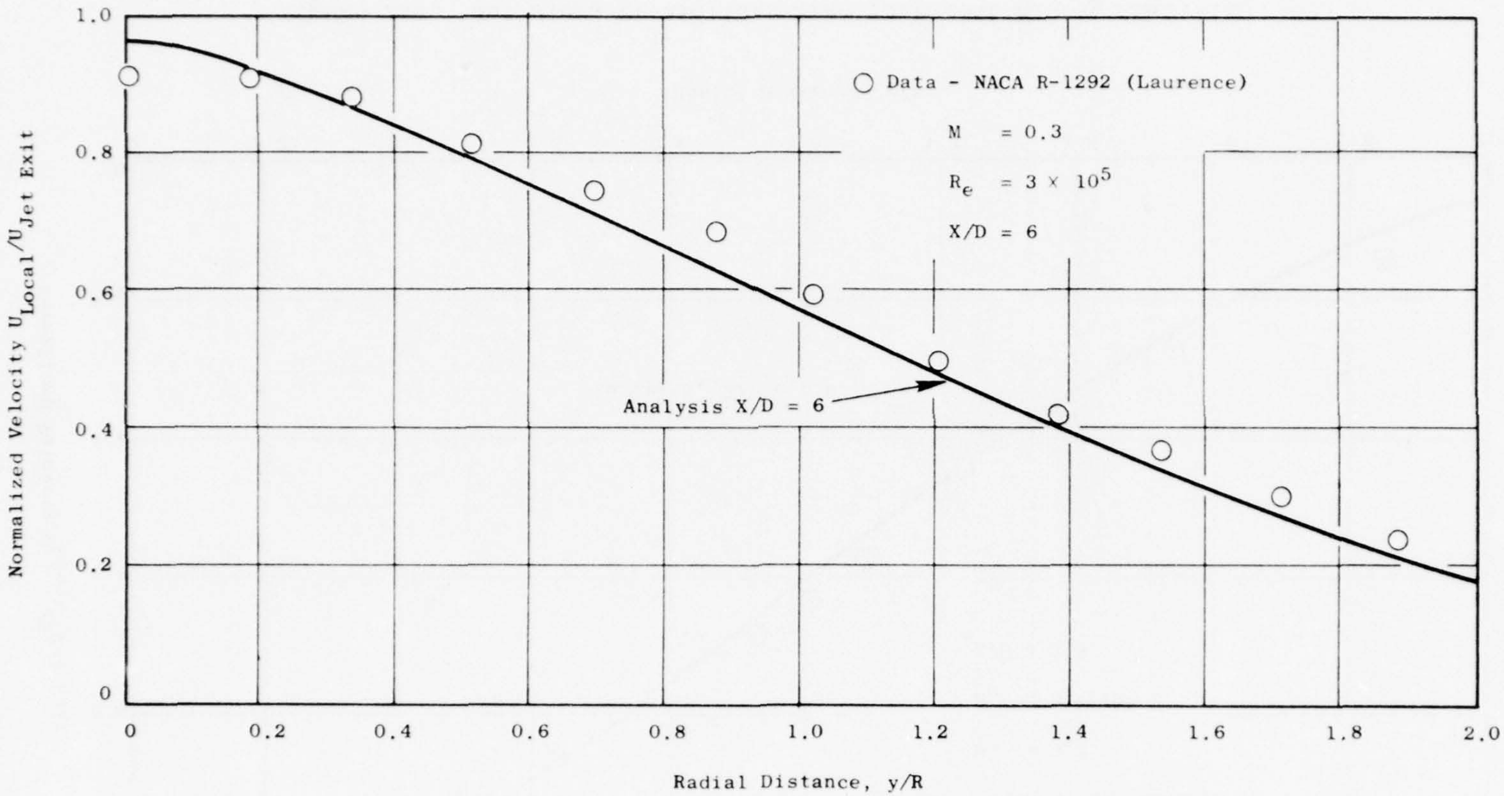


Figure 253. Jet Plume Predictions Free Turbulent Mixing Analysis.

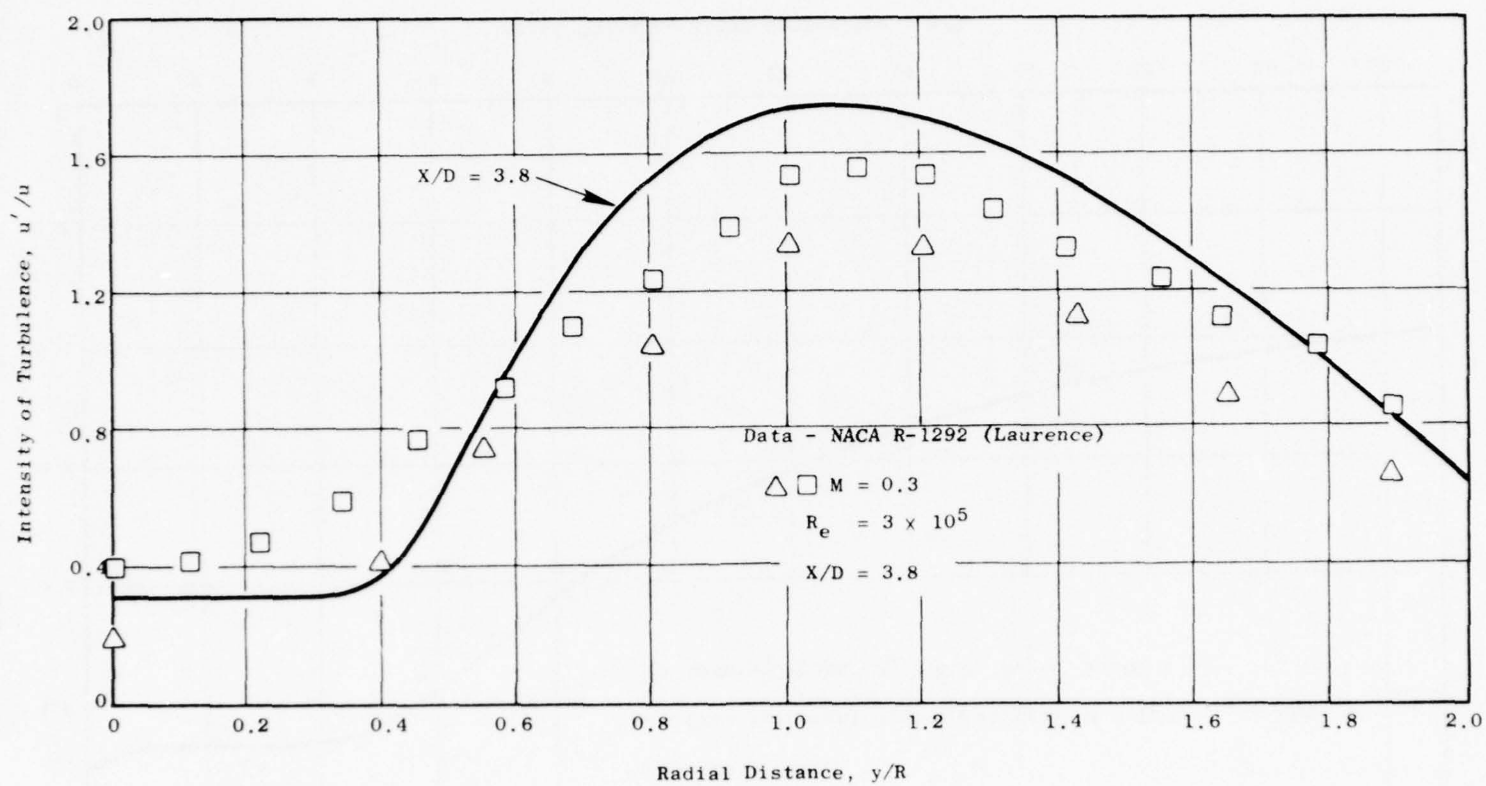


Figure 254. Jet Plume Predictions Free Turbulent Mixing Analysis.

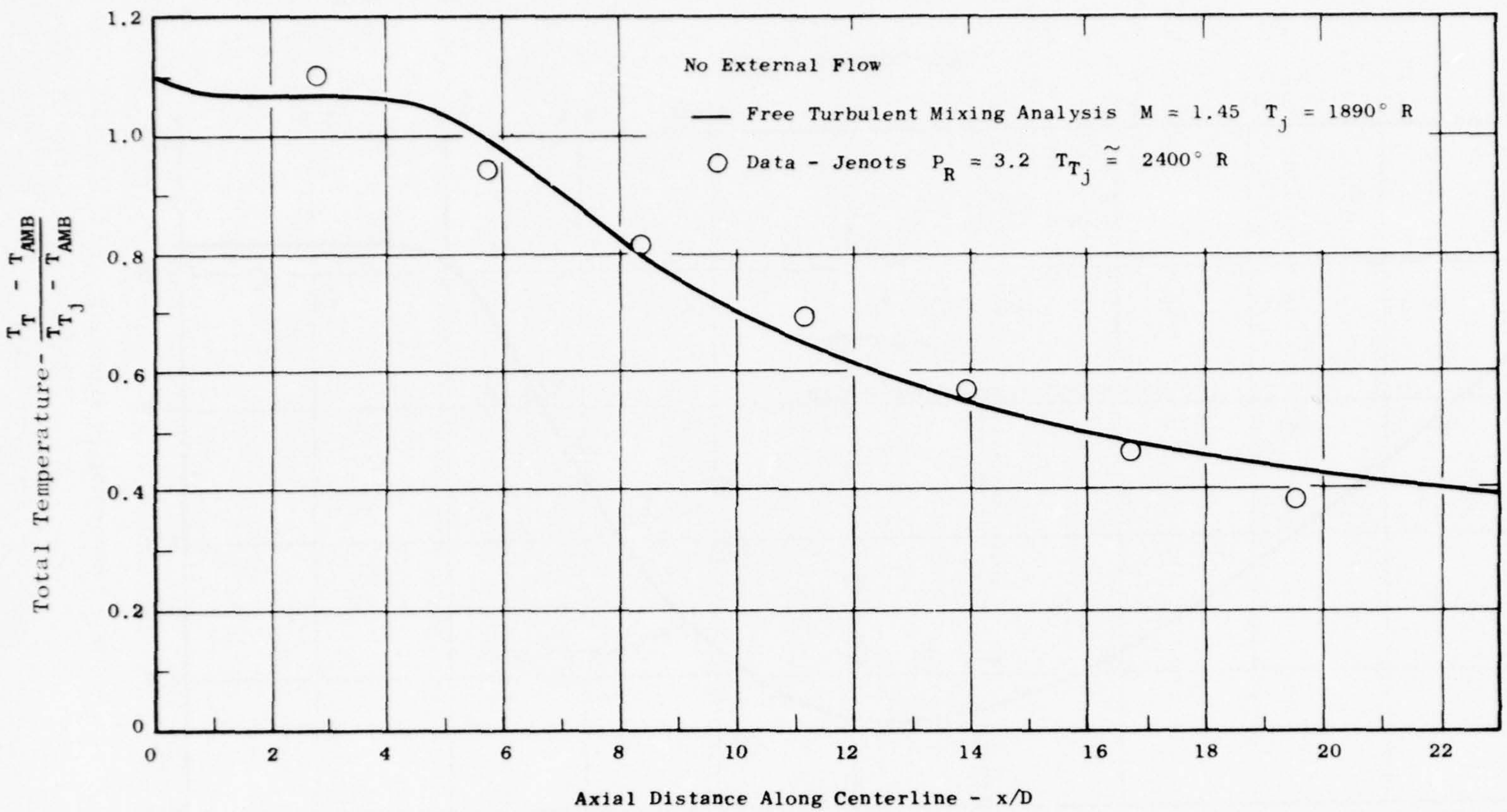


Figure 255. Free Turbulent Mixing Data Comparisons Total Temperature Decay Along Jet Axis.

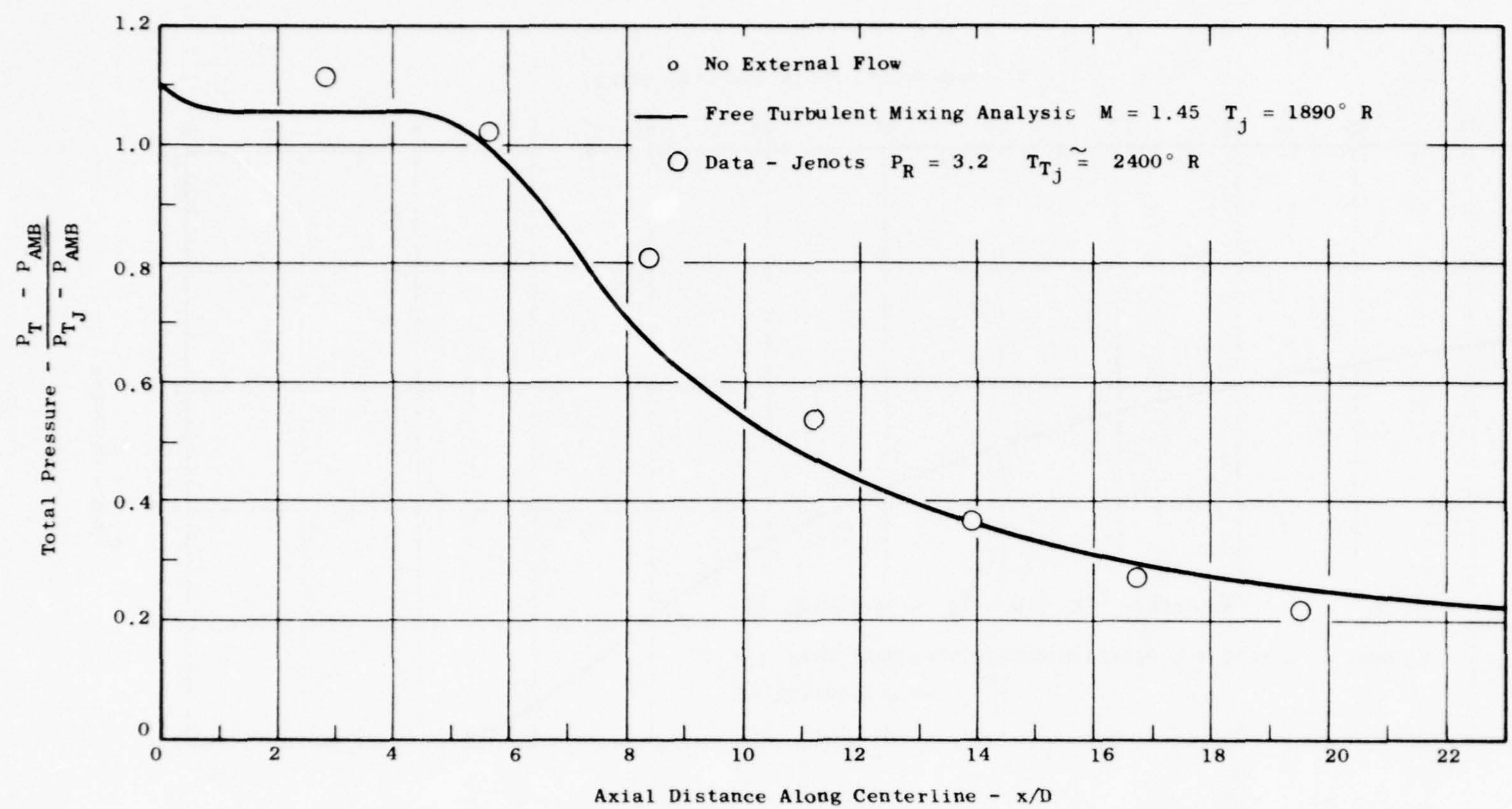


Figure 256. Free Turbulent Mixing Data Comparisons Total Temperature Decay Along Jet Axis.

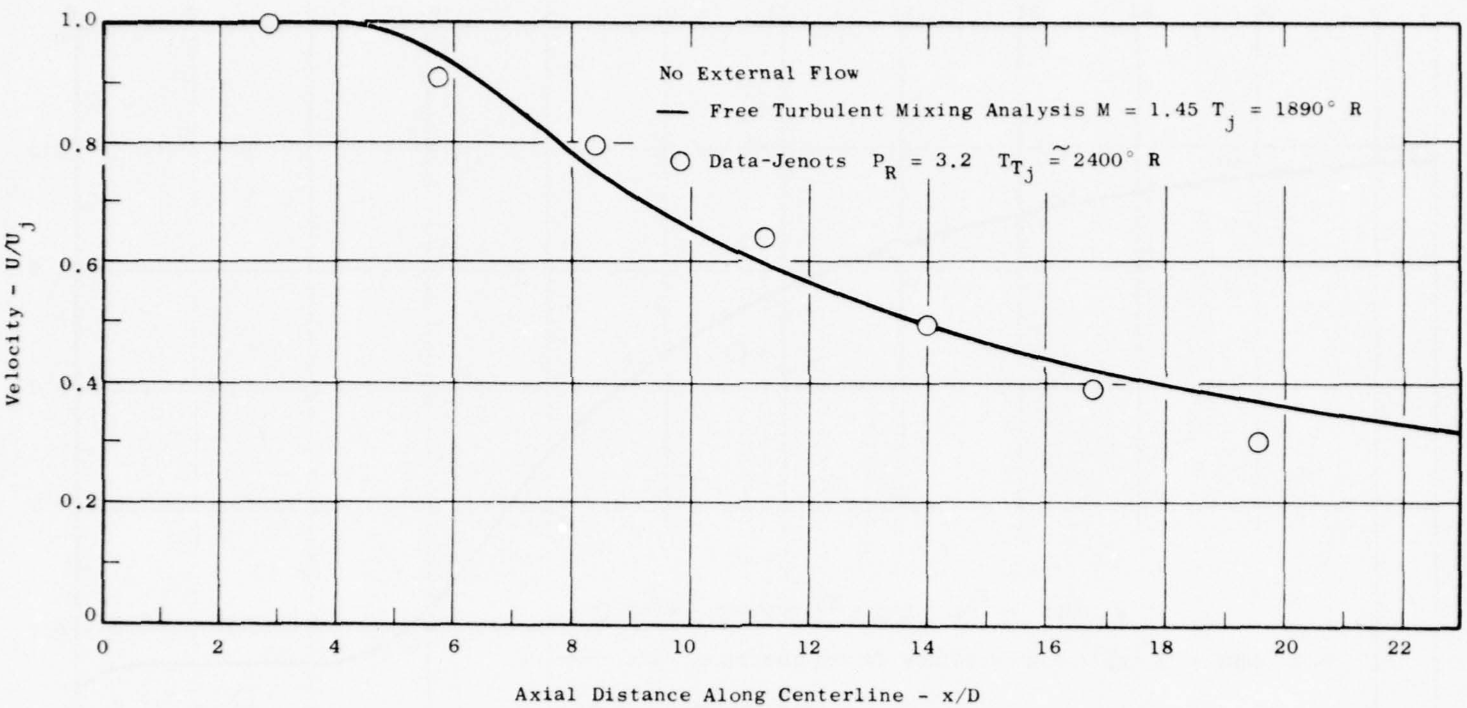


Figure 257. Free Turbulent Mixing Data Comparisons Velocity Decay Along Jet Axis.

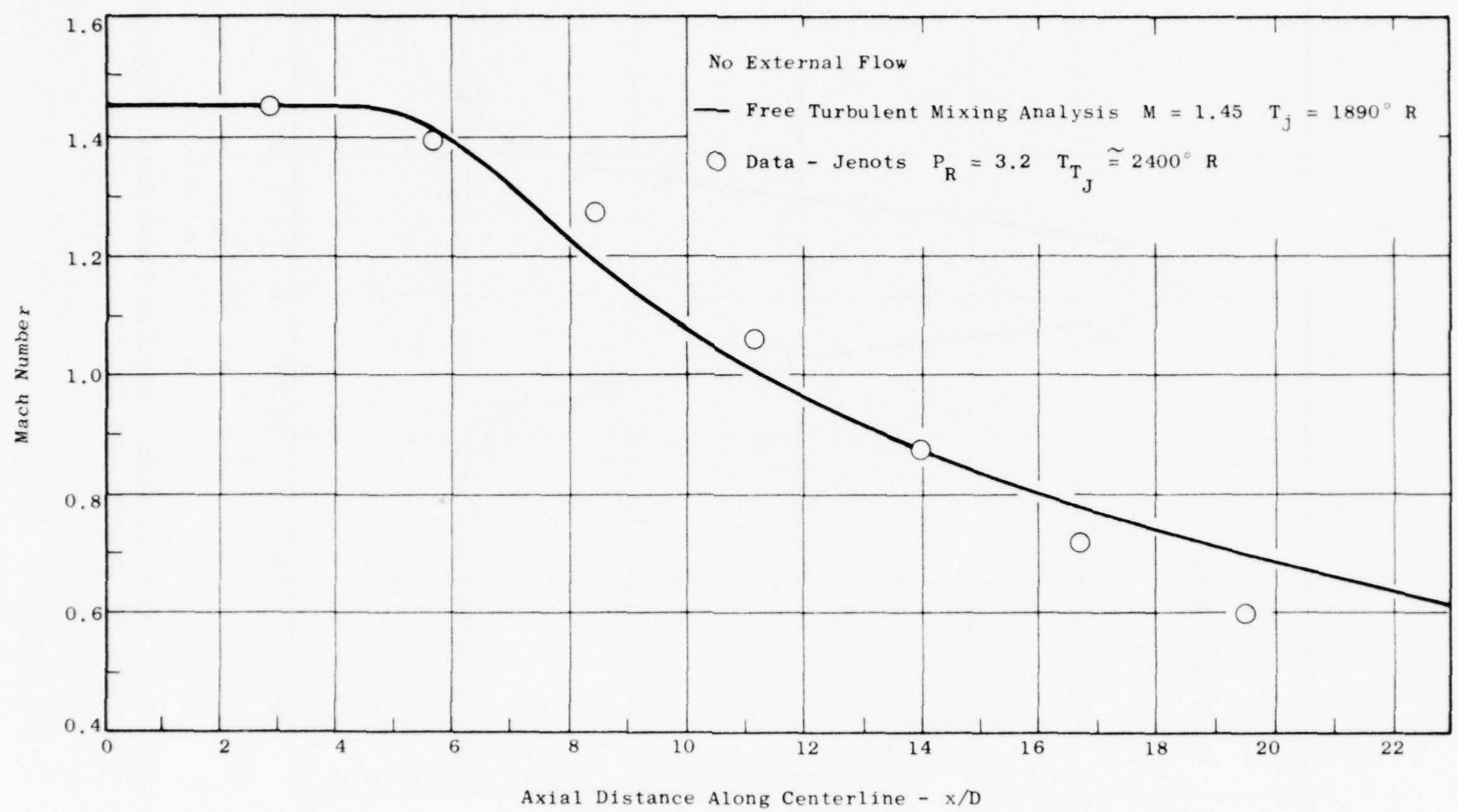


Figure 258. Free Turbulent Mixing Data Comparisons Mach Number Decay Along Jet Axis.

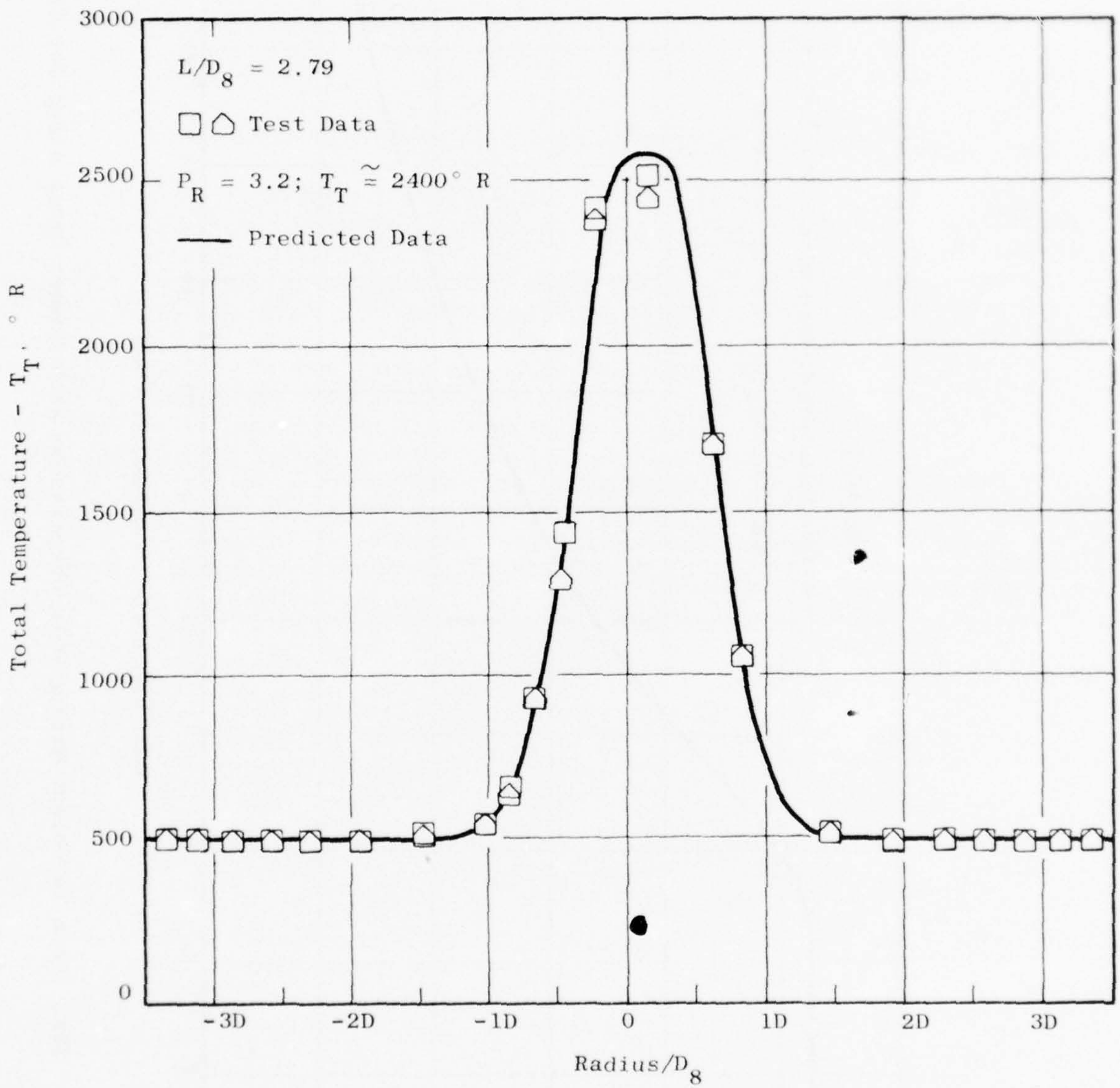


Figure 259. 4.3" Conical Nozzle Exhaust Plume Total Temperature Versus Radius, JENOTS Wake Rake Data.

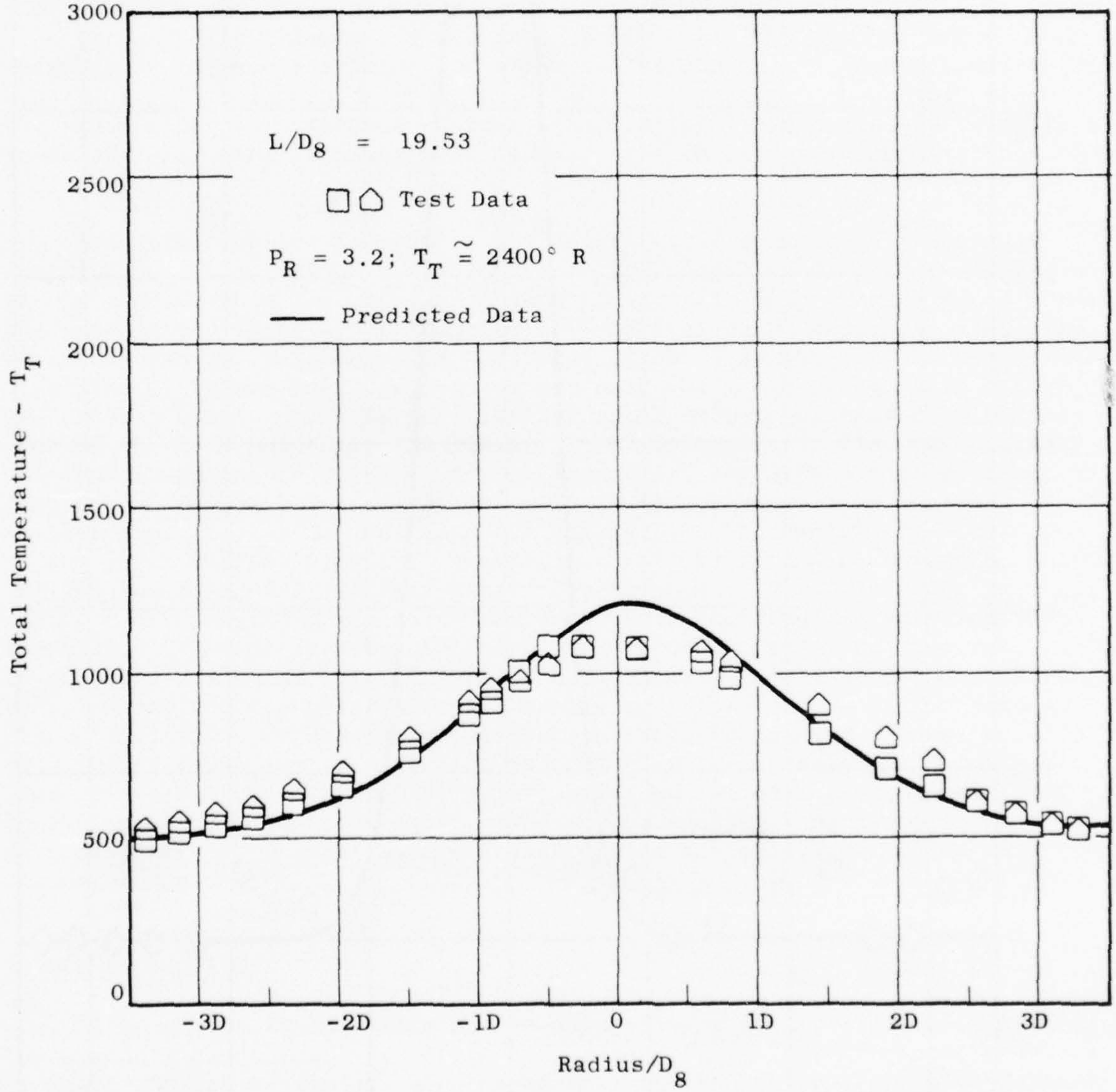


Figure 260. 4.3" Conical Nozzle Exhaust Plume Total Temperature Versus Radius, JENOTS Wake Rake Data.

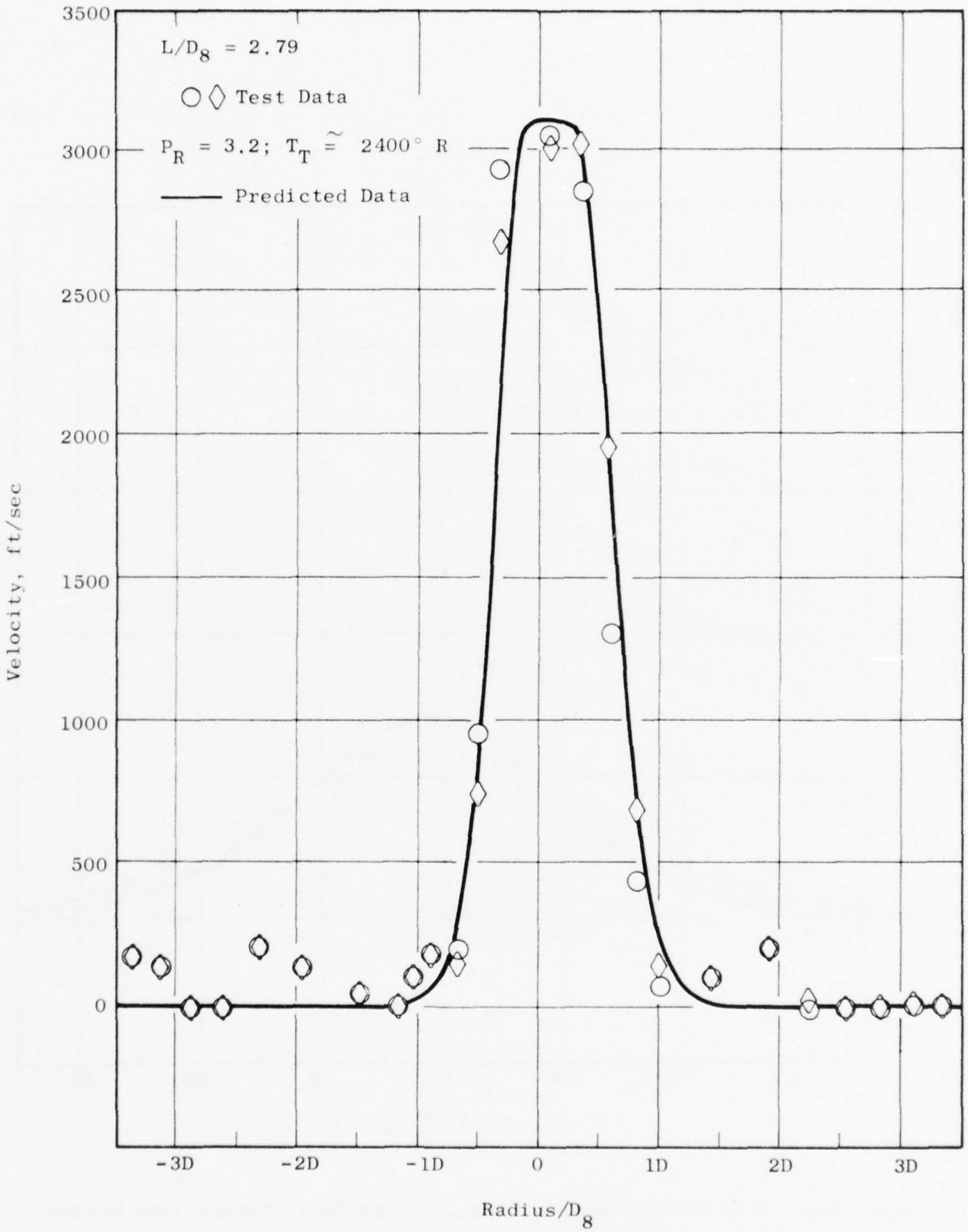


Figure 261. 4.3" Conical Nozzle Exhaust Plume Velocity Versus Radius, JENOTS Wake Rake Data.

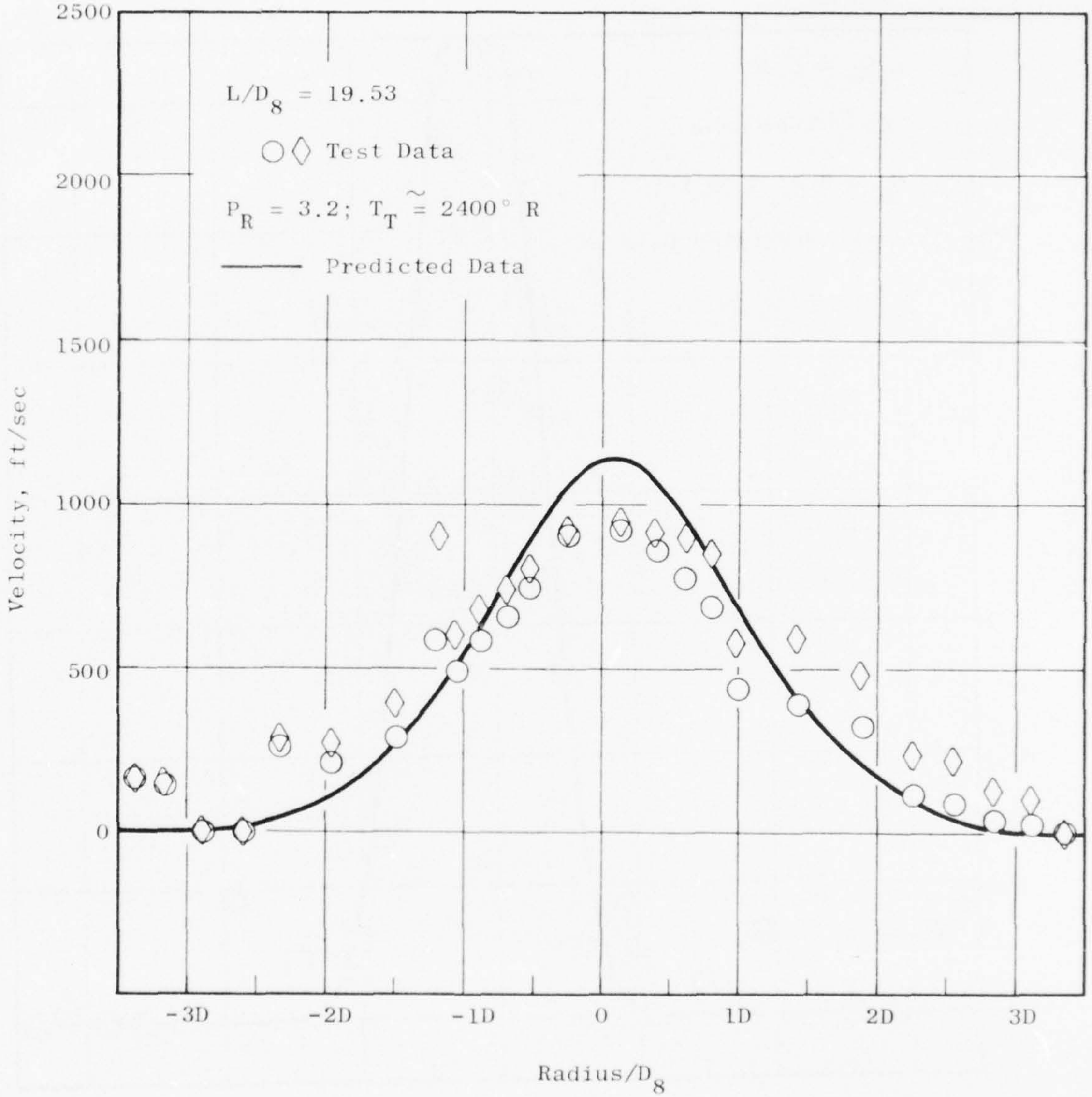


Figure 262. 4.3" Conical Nozzle Exhaust Plume Velocity Versus Radius, JENOTS Wake Rake Data.

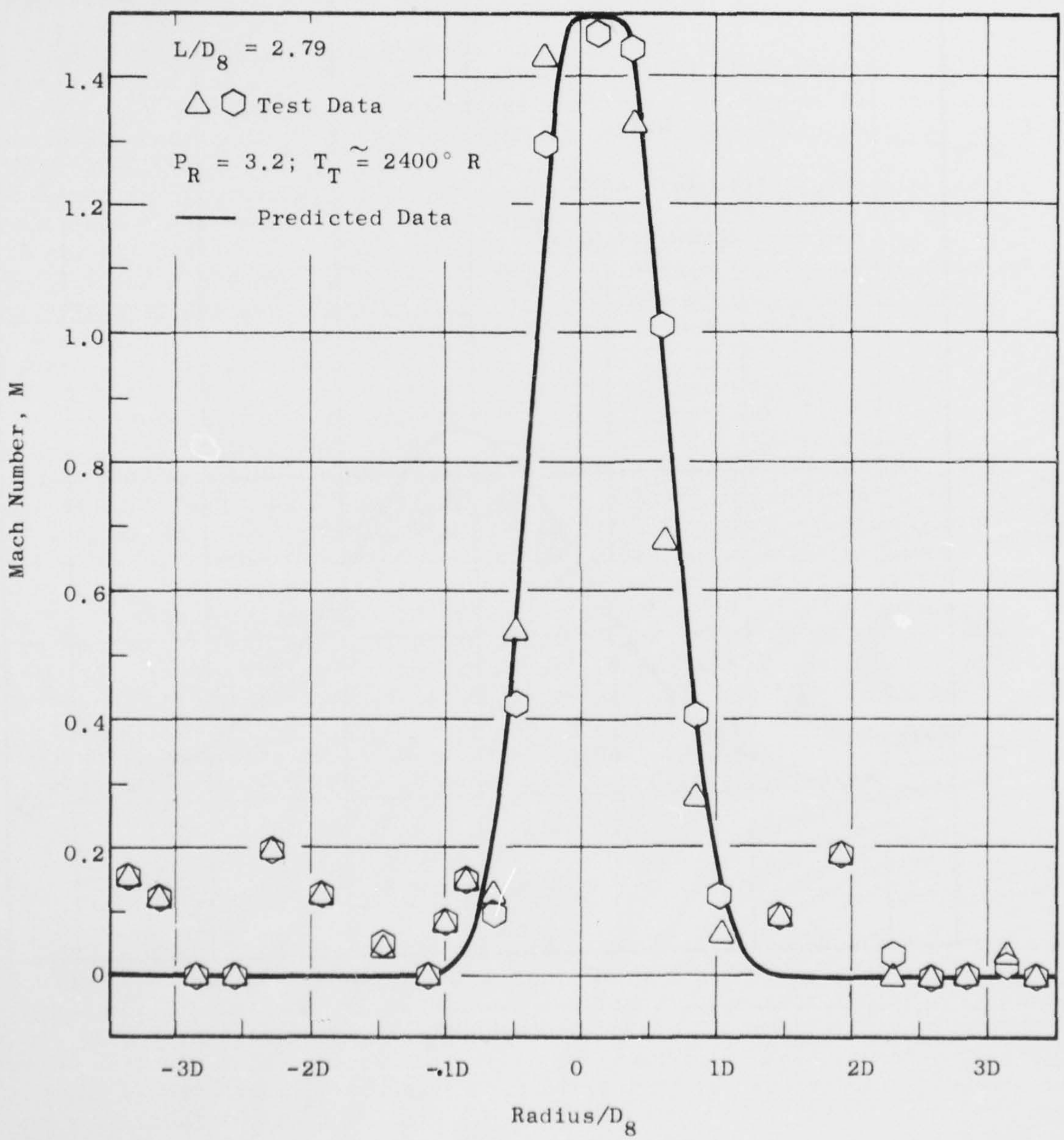


Figure 263. 4.3" Conical Nozzle Exhaust Plume Mach Number Versus Radius, JENOTS Wake Rake Data.

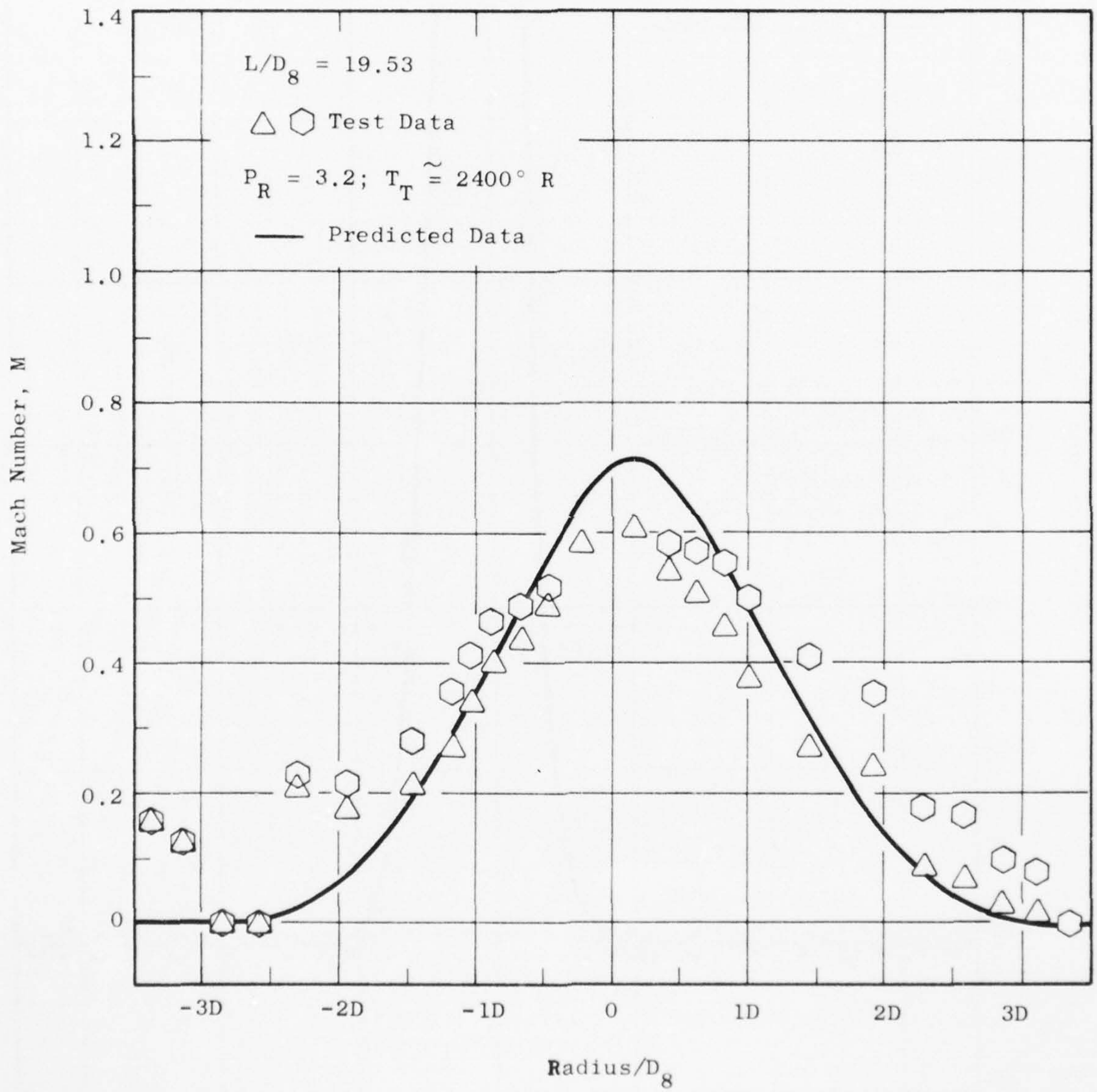


Figure 264. 4.3" Nozzle Exhaust Plume Mach Number Versus Radius, JENOTS Wake Rake Data.

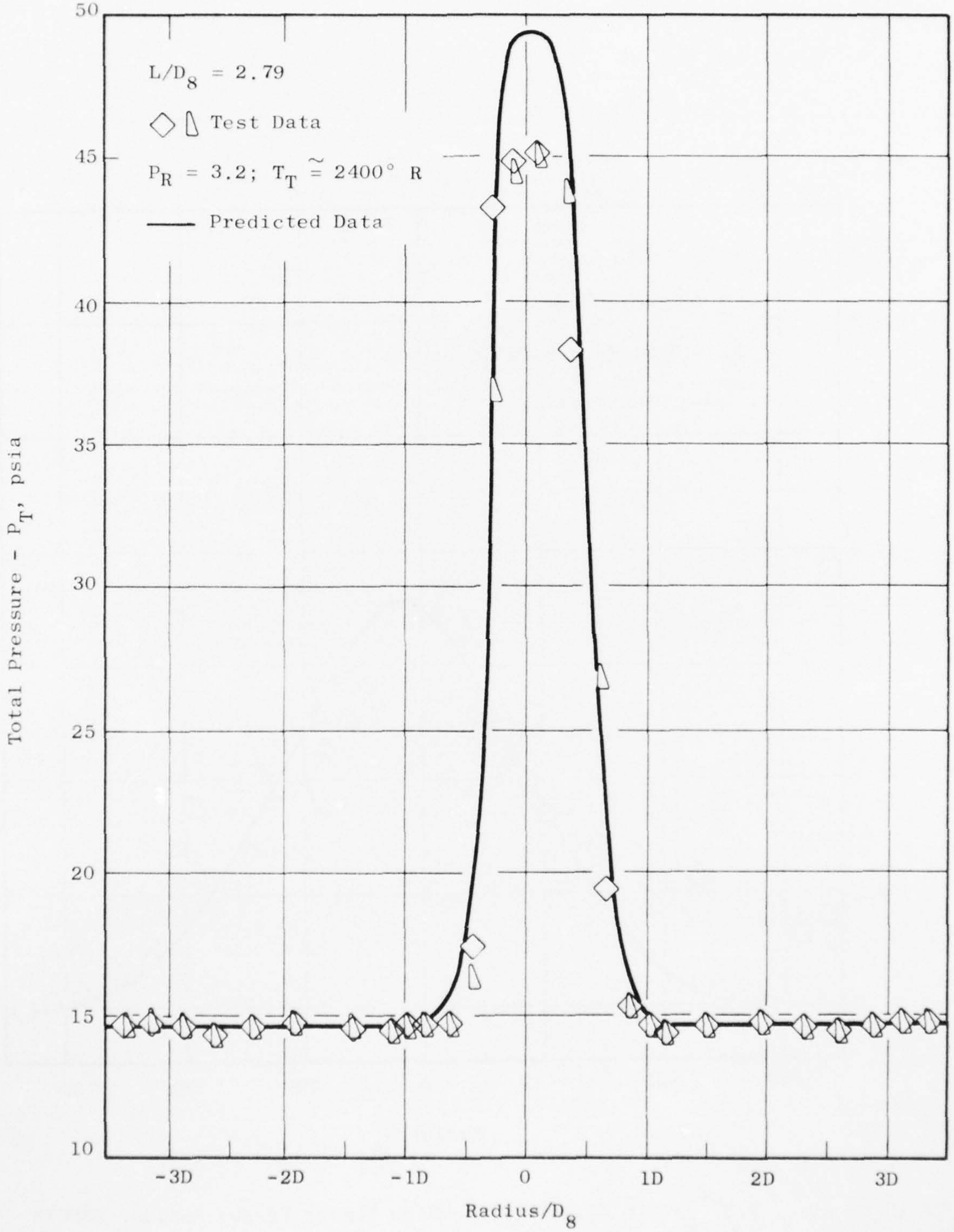


Figure 265. 4.3" Conical Nozzle Exhaust Plume Total Pressure Versus Radius, JENOTS Wake Rake Data.

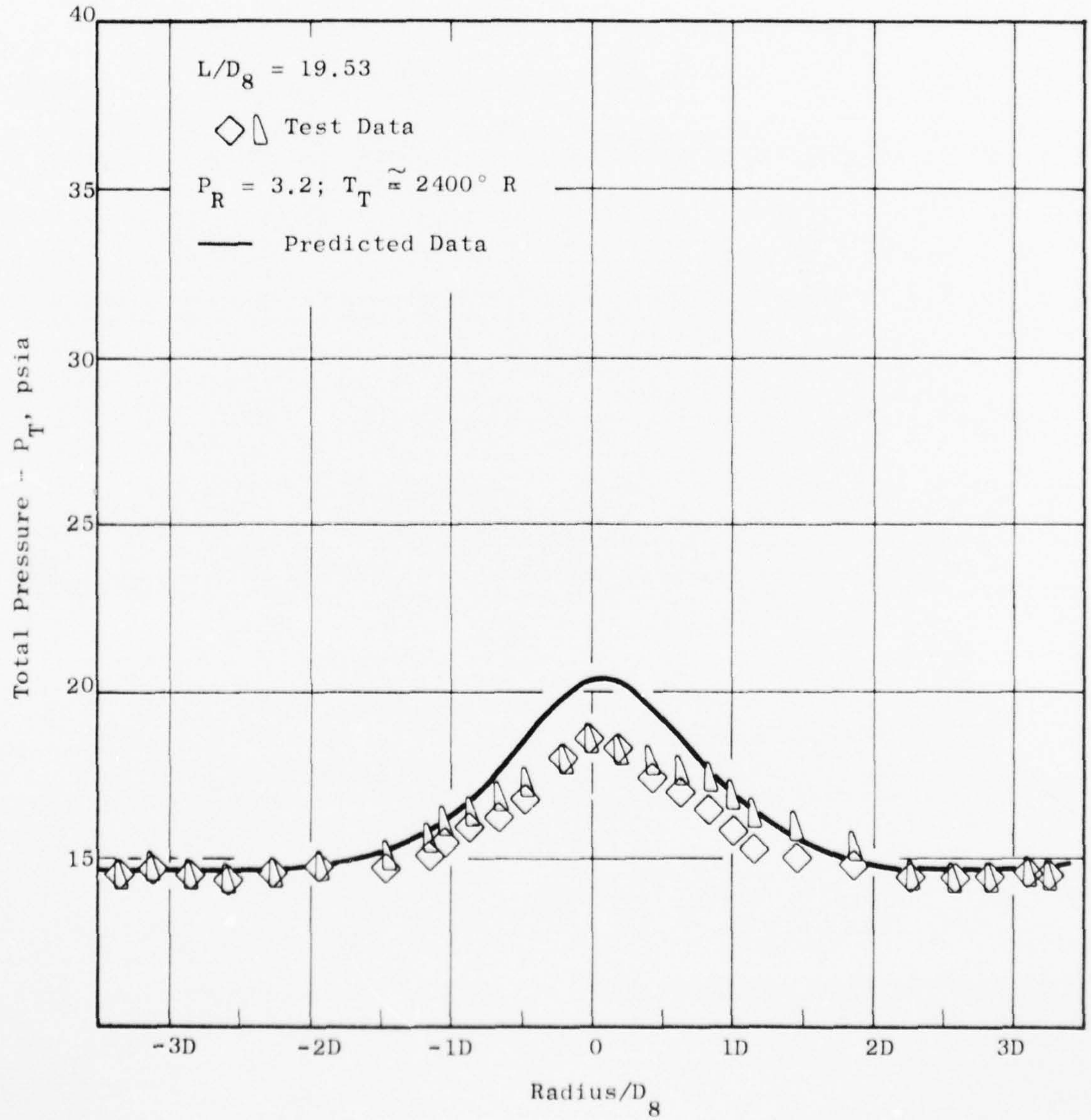


Figure 266. 4.3" Conical Nozzle Exhaust Plume Total Pressure Versus Radius, JENOTS Wake Rake Data.

model were not changed between the cold-jet predictions of Laurence's data and these hot-jet predictions. Consequently, the excellent agreement between the hot-jet data and the JETMIX predictions verifies that the analysis is capable of taking into account the effects of density changes in the flow.

APPENDIX 7

ANALYSIS INCORPORATED IN SSFD/MERGE

There are two distinct techniques which have been used to analyze the aerodynamic flow field in a supersonic jet. In the first approach, the jet is treated as a viscous, boundary layer flow. The resulting flow field is of the type depicted in Figure 267. According to the usual boundary layer approximations, the radial velocity components are assumed small in comparison to their axial counterparts, and, in addition, the pressure is taken to be constant throughout the whole flow field. These approximations implicity assume that the static pressure at the jet exit plane is identical to the ambient pressure and that Prandtl-Meyer expansions and/or shock waves are not present in the flow field. Consequently, this viscous boundary layer analysis can only be applied to subsonic jets, or to supersonic jets which are ideally (or nearly ideally) expanded.

In contrast to this viscous analysis, the second traditional technique for analyzing supersonic jets completely ignores the effects of turbulent mixing. In this second (inviscid) analysis, the full two-dimensional equations of motion are used, and strong radial and axial pressure gradients can occur. These pressure gradients have their origin at the nozzle exit plane where the static pressure generally is significantly different from the ambient pressure. In adjusting to the ambient pressure, the flow field generally develops a series of shock waves and Prandtl-Meyer expansions in a nearly periodic cell-like fashion. A schematic description of the qualitative features of a jet described by this two-dimensional analysis is shown on Figure 268.

As indicated above, both of these approximate models are applicable to the analysis of a certain class of supersonic jet. However, as might be expected, neither model applies to all supersonic jets. Thus, for example, the effects of friction can never be entirely removed from the jet. Further, supersonic jets are seldom uniform, parallel ideally expanded jets. Consequently, in order to obtain an acoustic prediction technique which is applicable to both ideally expanded and nonideally expanded jets, the aerodynamic model must include both two-dimensional effects and viscous mixing effects. This is accomplished by dividing the jet into an inner region and an outer region as shown in Figure 269. The outer region of the jet contains that part of the jet in which the effects of turbulent mixing are significant. Near the nozzle exit, the outer region is composed of a narrow annular portion of the flow field on the outer edge of the jet; downstream of the exit plane, the thickness of the outer region increases until eventually it includes the entire jet. In our analysis, this outer region is computed by our original viscous, boundary layer (JETMIX) computer program. Now, whereas the outer region of the jet is dominated by the effects of viscous mixing, the inner region of the jet is dominated by the familiar Prandtl-Meyer expansions and shock waves which characterize two-dimensional supersonic flow fields. In order to include

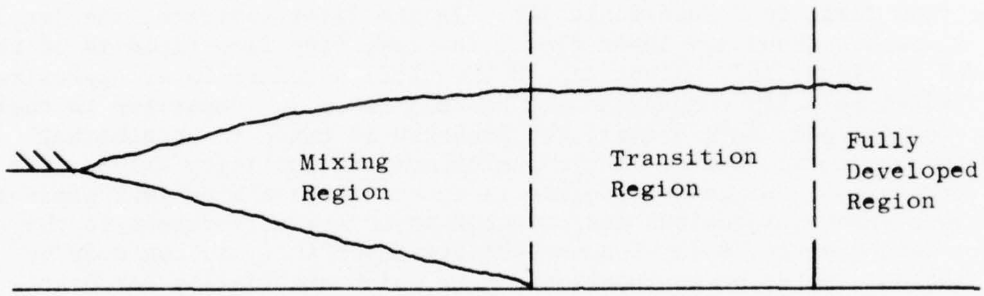


Figure 267. The Flowfield of an Ideally Expanded Viscous Jet.

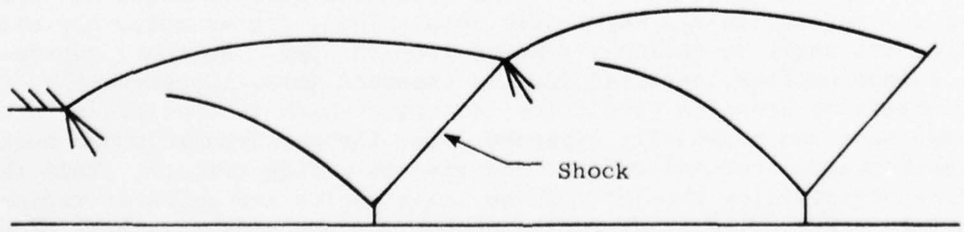


Figure 268. The Flowfield of an Inviscid Two-dimensional Supersonic Jet.

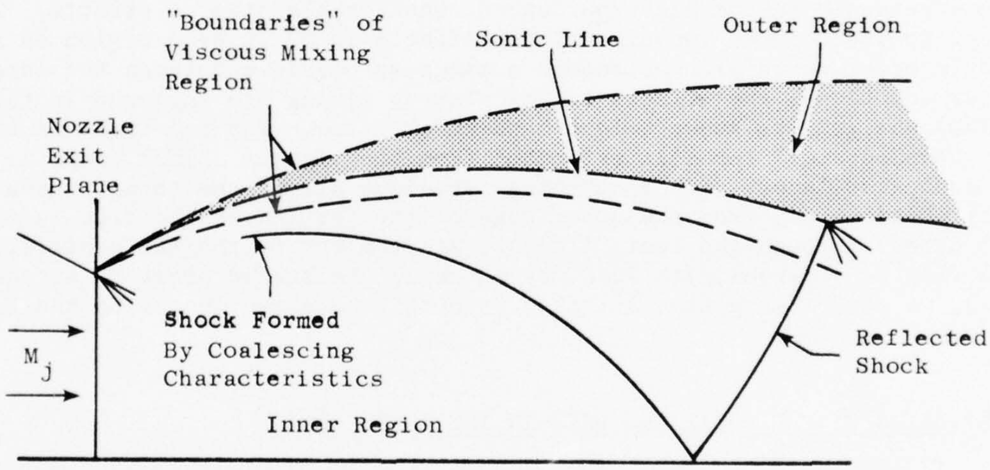


Figure 269. Subdivision of the Jet into Inner and Outer Regions (Outer Region Shown Shaded).

these effects in our aerodynamic model, a new computer program has been written to handle this inner region. This new program is called the Supersonic Finite Difference (SSFD) computer program. Thus, in the refined aerodynamic model, a supersonic jet is analyzed in two parts by two separate computer programs. The outer portion of the jet is analyzed by the viscous JETMIX analysis. The inner portion of the jet is computed by the two-dimensional SSFD analysis.

As indicated in Figure 269, these two separate parts of the flow field are matched along the sonic line. Thus, the inner portion of the flow field is supersonic while the outer flow is subsonic. (In actuality some constant Mach number line, which is slightly supersonic, is chosen as the matching line rather than precisely the sonic line.) However, it must be noted that the sonic line appears in the jet because viscous effects have reduced the Mach number of the formerly supersonic flow. This indicates that the outer edge of the supersonic region has experienced considerable viscous effects. Thus, in order to include the two-dimensional effects in as large a region as possible, and in order to enforce as smooth a match as possible between the inner and outer solutions, the effects of the viscous mixing are included in the inner (SSFD) analysis as known "right-hand-side" terms. The magnitude of the "right-hand-side" terms is estimated from the viscous JETMIX computer program as indicated later. This matching technique allows the total pressure to vary continuously from the outer edge of the jet (where the flow is essentially stagnated) through the sonic line and all the way to the jet centerline (where the flow is supersonic). Then, by matching the static pressure at the sonic line, we can be sure that all flow properties are continuous at the matching line.

DERIVATION OF THE EQUATIONS USED IN THE INNER REGION

As indicated above, the equations used in the inner region include the viscous effects as "right-hand-side" terms. In order to obtain the form of these "right-hand-side" terms, the equations for the inner region are obtained from the complete Navier-Stokes equations. An outline of the derivation follows.

The equations of motion for steady, compressible, viscous flow are:

$$\nabla \cdot \rho \bar{v} = 0 \tag{265}$$

$$\rho (\bar{v} \cdot \nabla) \bar{v} + \nabla p = \nabla \cdot \bar{\bar{\tau}} \tag{266}$$

$$- \rho \bar{v} \cdot \nabla e = \bar{\bar{\tau}} : \nabla \bar{v} - p \nabla \cdot \bar{v} \quad \nabla \cdot \bar{q} \tag{267}$$

where:
- e = internal energy
- p = pressure
- $\bar{q}$ = heat flux vector

$\bar{v}$ = velocity vector

ρ = density

$\bar{\bar{\tau}}$ = viscous stress tensor

Two vector identities which are useful are:

$$\bar{v} . (\bar{v} . \nabla) \bar{v} = \bar{v} . \nabla [(\bar{v} . \bar{v})/2] \tag{268}$$

$$\bar{v} . (\nabla . \bar{\bar{\tau}}) = \nabla . (\bar{v} . \bar{\bar{\tau}}) - \bar{\bar{\tau}} : \nabla \bar{v} \tag{269}$$

If we dot equation (266) by the velocity vector, $\bar{v}$, and use identity (268), we obtain:

$$\rho \bar{v} . \nabla [(\bar{v} . \bar{v})/2] + \bar{v} . \nabla p = \bar{v} . (\nabla . \bar{\bar{\tau}}) \tag{270}$$

Then, combining equations (265) and (267) and using identity (269), the energy equation becomes:

$$\rho \bar{v} . \nabla h - \bar{v} . \nabla p = \nabla . (\bar{v} . \bar{\bar{\tau}}) - \bar{v} . (\nabla . \bar{\bar{\tau}}) - \nabla . \bar{q} \tag{271}$$

where we have also converted from internal energy to enthalpy. Then, adding equations (270) and (271) gives:

$$\rho \bar{v} . \nabla h^{\circ} = \nabla . (\bar{v} . \bar{\bar{\tau}}) - \nabla . \bar{q} \tag{272}$$

where: h = enthalpy

h° = stagnation enthalpy

We now define the scalar function, Q, as:

$$Q (x,y) = \rho \bar{v} . \nabla h^{\circ} \tag{273}$$

and, by equation (272), we also have:

$$Q (x,y) = \nabla . (\bar{v} . \bar{\bar{\tau}}) - \nabla . \bar{q} \tag{274}$$

If we now combine equation (274) with equation (271) and use the thermodynamic equation of state, the energy equation becomes:

$$\rho T (\bar{v} . \nabla s) = - \bar{v} . (\nabla . \bar{\bar{\tau}}) + Q \tag{275}$$

where: s = entropy

T = temperature

Finally, defining the scalar function, ϕ, as:

$$\phi\ (x,y) = \bar{v}\ .\ (\nabla\ .\ \bar{\bar{\tau}}) \tag{276}$$

we can write the entropy variation along a streamline as:

$$\rho\ T\ \bar{v}\ .\ \nabla\ s = -\ \phi + Q \tag{277}$$

Thus, the equations of motion can now be rewritten as:

$$\nabla\ .\ \rho\ \bar{v} = 0 \tag{278}$$

$$\rho\ (\bar{v}\ .\ \nabla)\ \bar{v} + \nabla p = \bar{R} \tag{279}$$

$$\rho\ T\ \bar{v}\ .\ \nabla\ s = -\ \bar{v}\ .\ \bar{R} + Q \tag{280}$$

where the vector $\bar{R}$ is defined as:

$$\bar{R} = \nabla\ .\ \bar{\bar{\tau}} \tag{281}$$

so that:

$$\phi\ (x,\ y) = \bar{v}\ .\ \bar{R} \tag{282}$$

At present, the SSFD program limits the function, $Q\ (X,Y)$, to the trivial function:

$$Q\ (x,y) = 0 \tag{283}$$

This implies that only flow fields which have uniform total temperature throughout can be calculated. The extension of the computer program to include an arbitrary specification of the stagnation enthalpy is relatively simple. Note that the function, ϕ, is not restricted; it can (in principle) be any function. When coupled to the JETMIX viscous analysis, the SSFD program automatically determines ϕ from the JETMIX-predicted entropy gain due to the turbulent stresses.

The equations of motion (278), (279), and (280) can be expressed in x-y coordinates as:

$$\frac{\partial}{\partial x}(\rho u y^{\varepsilon}) + \frac{\partial}{\partial y}(\rho v y^{\varepsilon}) = 0 \tag{284}$$

$$\rho u \frac{\partial u}{\partial x} + \rho v \frac{\partial u}{\partial y} + \frac{\partial p}{\partial x} = R_1 \tag{285}$$

$$\rho u \frac{\partial v}{\partial x} + \rho v \frac{\partial v}{\partial y} + \frac{\partial p}{\partial y} = R_2 \tag{286}$$

$$\rho T \left(u \frac{\partial s}{\partial x} + v \frac{\partial s}{\partial y}\right) = - \phi + Q \tag{287}$$

where: $\varepsilon = 0$ Plane (2-D) flow

$\varepsilon = 1$ Axisymmetric flow

R_1, R_2 = Axial and transverse components of $\bar{R}$

u, v = Axial and transverse components of velocity, $\bar{v}$

Since the inner region is restricted by definition to be a supersonic flow region, it follows that equations (284) through (287) form a system which is hyperbolic in character. Consequently, these equations, like the (parabolic) boundary layer equations which are used in the outer region, can be solved by a marching technique. Although the classical method-of-characteristics (MOC) procedure could be used to solve these equations, we have chosen to use an explicit finite-difference algorithm, since it is somewhat simpler and is more easily adapted to the matching procedure. During the calculation, the inner solution is determined on a series of axial planes at successively greater distances from the nozzle exit. The use of axial computation stations in the inner solution is convenient, since the outer solution also is determined on axial planes. Similarly, both analyses use the stream function, ψ, as the cross-stream variable. Streamline-following simplifies the enforcement of the desired entropy and stagnation enthalpy variations along the streamlines.

TRANSFORMATION OF THE DIFFERENTIAL EQUATIONS

Before being replaced by their finite-difference equivalents, equations (284) through (287) are transformed to the x-ψ coordinate system. The stream function, ψ, is defined by:

$$\frac{\partial \psi}{\partial y} = \rho u y^{\varepsilon} \qquad \frac{\partial \psi}{\partial x} = - \rho v y^{\varepsilon} \tag{288}$$

The dependent variables also are replaced by the more convenient quantities:

- logarithm of pressure, ln p
- tangent of the local flow angle, $\tau = \frac{v}{u}$
- entropy, s
- stagnation enthalpy, h°

These four quantities represent the classical dependent variables for two-dimensional supersonic flow calculations, with two minor changes. First of all, the pressure has been expressed as the natural logarithm of the pressure, rather than as the pressure itself. This variation has been suggested in Reference 162 as a means of obtaining more accurate results in finite-difference calculations. Our experience has verified this finding, particularly in regions of high gradients such as those near the focal point of expansion fans. An unfavorable aspect of using ln p rather than p is that an increase in processing time is required, but the improved accuracy and reliability of the code seems to justify this added expense. The second change, the use of τ rather than the flow angle, θ, is based on computational economy. There seems to be no accuracy advantage for using either τ or θ as the second dependent variable; consequently, τ has been chosen because it eliminates extensive use of the trigonometric functions. The remaining two *primary variables* (entropy, s) and (stagnation enthalpy, h°) are chosen since the variation of these functions will be specified along the streamlines.

Transforming to the x-ψ coordinate system and introducing the new dependent variables leads to the system of equations:

$$\rho\, T\, u \frac{\partial s}{\partial x} = -\,\phi\,(x,\psi) + Q\,(x,\psi) \tag{289}$$

$$\rho\, u \frac{\partial h^\circ}{\partial x} = Q\,(x,\psi) \tag{290}$$

$$\rho\, u^2 \frac{\partial \tau}{\partial x} + (1 + \tau^2)\, \rho u y^\varepsilon \frac{\partial p}{\partial \psi} - \tau \frac{\partial p}{\partial x} = \tau R_1 \tag{291}$$

$$\left(\frac{u^2}{c^2} - 1\right) \frac{\partial p}{\partial x} + \rho^2 u^3 \frac{\partial (y^\varepsilon \tau)}{\partial \psi} + \rho v y^\varepsilon \frac{\partial p}{\partial \psi} = -\left(1 + \frac{u^2}{h}\right) R_1 \tag{292}$$

where we have used the assumptions of a perfect gas with constant specific heats. Note that, since partial differentiation with respect to x implies differentiation along a streamline, equations (289) and (290) represent the substantial derivatives of entropy and stagnation enthalpy. These equations explicitly relate the variation of s and h° along streamlines to the viscous effects.

Equations (289) through (292) are solved numerically by the MacCormack two-step finite-difference algorithm (Reference 163). This procedure is simpler and faster than the classical Lax-Wendroff technique (see Reference 164), but still maintains second-order accuracy. Being explicit, the algorithm is only conditionally stable, and the maximum stream-wise step size is limited by the Courant-Friedrichs-Lewy (CFL) condition (see Reference 164).

The marching calculation starts by determining the entropy and stagnation enthalpy at the new x-station for a particular streamline from equations (289) and (290). This is basically a table-lookup operation. Then, the pressure at the new x-station is determined from equation (292); and, finally using this value of $\partial p/\partial\psi$, the flow angle at the new station is determined from equation (291).

The SSFD computer program is limited to equal spacing in the stream function, ψ. Changing to variable cross-stream-mesh spacing is possible; but, with the MacCormack algorithm, a change to variable-mesh spacing would render the calculation first-order accurate. (Note that each downstream step size is calculated as the computation proceeds so that, in general, no two-stream-wise step sizes are identical but rather only the cross-stream-mesh widths are the same.) Equal intervals in ψ implies equal amounts of mass flow between each of the mesh points in the field. In an axisymmetric flow calculation, this equal spacing in stream-function means that the grid points will become less dense in physical space as the axis is approached. This tendency is further amplified in an underexpanded exhaust jet because the flow responds to the lower ambient pressure by expanding and, by so doing, moves the points nearest the axis of symmetry further from the centerline. In order to counteract this grid-point spreading near the centerline, an existing SSFD capability for running two parallel flows was used. Thus, any jet calculation is run as a coannular pair of jets with a complete slip-line boundary between them. Since the coannular jets are really comprised from a single jet, no discontinuity in temperature or stagnation pressure is used across the slip line. This coannular jet artifice is used only to increase the density of grid points near the axis of symmetry while, at the same time, maintaining the convenience and economy of equal cross-stream spacing. As the program is currently set up, it will automatically divide any axisymmetric jet into two coannular ones.

BOUNDARY CONDITIONS

Although the field points are calculated by a finite-difference technique, the boundary conditions are enforced by means of a method-of-characteristics approach similar to the one used by Moretti (Reference 165) for time-dependent, finite-difference calculations. The desirability of using MOC boundary conditions in finite-difference calculations has been verified in a recent study by Abbett (Reference 166), in which he demonstrated that the MOC approach (along with one other method) was significantly more accurate than an entire series of other numerical boundary conditions.

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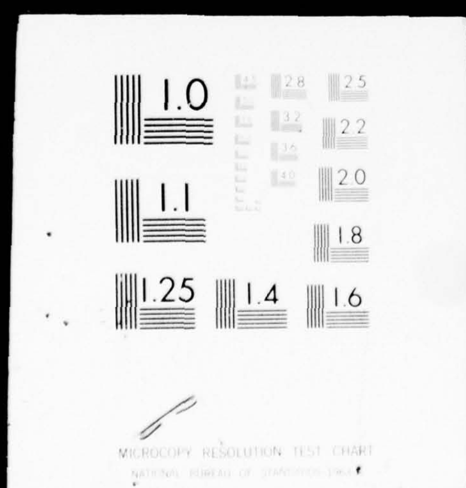


In applying the boundary conditions, we first note that the characteristic directions are unaffected by the viscous "right-hand-side" terms and so remain the same as in inviscid flows. The viscous terms, however, do affect the compatibility conditions which must be enforced along the characteristics.

By using standard techniques, the compatibility conditions can be shown to be:

$$\pm \rho u^2 d\tau + \sqrt{M^2 - 1}\, dp \tag{293}$$

$$= - \left[\frac{\tau}{y} \rho uc - \frac{\gamma-1}{c} (-\phi+Q) + \frac{cR_1}{u(1+\tau^2)} \left(\tau \sqrt{M^2-1} + 1\right)\right] d\ell$$

where: c = speed of sound

M = Mach number

γ = ratio of specific heats

At the outer edge of the jet, the pressure is specified; and, the single characteristic from the new boundary point to the previous x-station is sufficient to determine the flow angle, v/u, as shown in Figure 270. Along the axis of symmetry, the flow angle must go to zero. In this case, it is the pressure which is determined from the compatibility relation.

In either of these MOC calculations, it is necessary to know the value of the flow properties where the characteristic intersects the plane corresponding to the previous x-station. In all cases such as these, the values are found by means of linear interpolation. The use of higher order interpolation formulas is not recommended, since they frequently lead to increased errors arising from the nonanalytic nature of the supersonic flow variables.

METHOD FOR INCLUDING DISCRETE SHOCKS

The presence of discrete shock waves in a supersonic flow field, and the calculation of their location and strength, introduces two distinct problems. First, since the shock wave, in general, will lie between two field points (rather than being concident with one of them), additional shock-point storage locations must be introduced. Once these additional storage locations are provided, the propagation of the shock can be accomplished in a relatively straightforward manner. The particular method we have chosen is analogous to our technique for calculating boundary points, in that an MOC procedure is used. Thus, in computing the shock locus from the previous x-station to the new x-station, the new radial position of the shock is first approximated. The properties on the upstream side of the shock are then calculated by using the complete MOC equations along both the left-running and the right-running characteristics, as shown in Figure 270. Then, by geometrical relationships, the shock angle at the downstream station can be

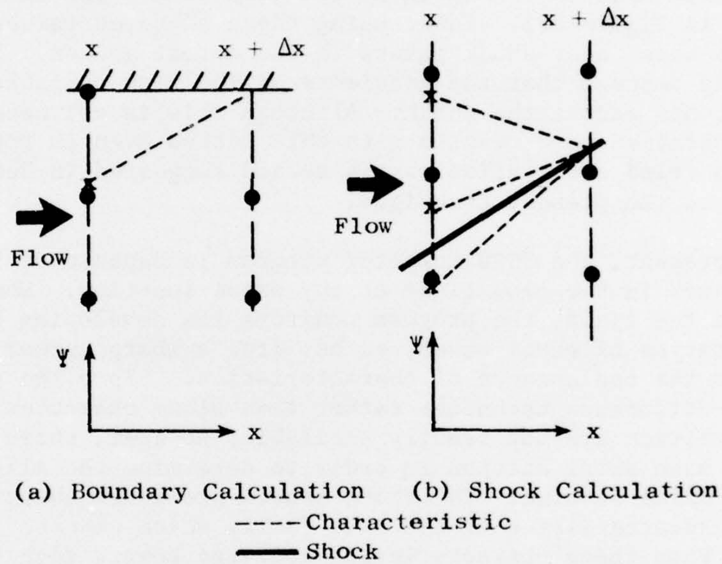


Figure 270. Calculation of Boundary Conditions and Shock Strength and Location by Method of Characteristics.

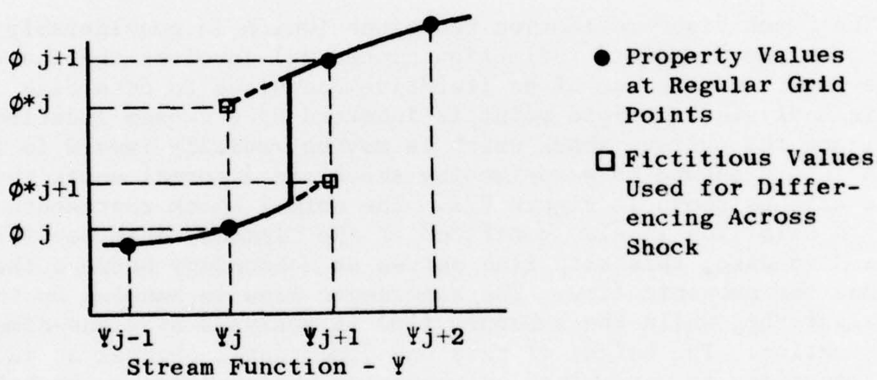
determined. The known conditions in front of the shock, plus the shock angle, are then sufficient to define all properties downstream of the shock via the Rankine-Hugoniot jump conditions. Then, finally, the compatibility condition for the single characteristic which overtakes the shock from the downstream side can be used to improve the predicted location of the shock.

A second problem which must be surmounted when there is a shock in the flow field is the calculation of the regular field points which are adjacent to the shock. Calculation of such points requires a finite-difference technique which "reaches across" the shock. In our analysis, we adjust the properties on the opposite side of the shock by the jump values for that particular quantity, as shown in Figure 271. Then, using these adjusted values, we proceed to calculate these near-shock points in the normal manner. This procedure implicitly assumes that the gradients of the flow variables change by only small amounts across the shock. Although this is not necessarily the case, we have obtained good results with this method even in rotational flows. We have also tried a variation of the method suggested in Reference 167, but have returned to the present technique.

At present, the SSFD computer program is capable of including only a single shock in the flow field at any axial location. When there are no shocks in the field, the program monitors the developing solution to detect the generation of shock waves, either from a sharp corner in a solid boundary, or due to the coalescence of characteristics. Since the program operates on a finite-difference technique rather than along characteristic lines, the characteristics are not readily available; however, their slopes are calculated at each axial station in order to determine the allowable step size to the next axial station. The shock search procedure observes the angle change between characteristics of the same family which emanate from adjacent grid points. When these characteristics converge toward each other at faster than a prespecified rate (currently set at 5 degrees), a shock is inserted and the coalescing waves are represented by a discontinuous Rankin-Hugoniot jump. This shock search procedure is quite simple and, to date, has proved to be reliable.

SHOCK REFLECTION FROM AXIS OF SYMMETRY

As a shock wave in an axisymmetric flow field approaches the centerline, the shock becomes increasingly steeper. Because of this steepening, the axisymmetric equations will not allow the shock to reflect from the symmetry axis in a regular fashion. Instead, some sort of "strong" reflection must occur. As a result, a local pocket of subsonic flow appears behind the shock, and any computational procedure which relies on the hyperbolic character of the equations becomes invalid and has to be terminated. However, experimental Schlieren photographs show that this subsonic region is frequently small or even nonexistent (Reference 168). Thus, although the reflection shows up as a nearly normal "Mach disc" or "Rieman wave" in some cases, an apparently regular reflection takes place in other cases when the shock is sufficiently weak (even though the inviscid equations will not allow this). In order to



$$\phi^*_j = \phi_j + \Delta\phi$$

$$\phi^*_{j+1} = \phi_{j+1} - \Delta\phi$$

$\Delta\phi$ = Shock Jump for Property ϕ

Figure 271. Method for Obtaining Fictitious Shock-corrected Properties for Use in Calculating Field Points Adjacent to Shocks.

provide a means for continuing the flow field calculation beyond the location at which the shock first reflects from the axis of symmetry, we have incorporated two approximate techniques for "calculating through" this presumably small, localized subsonic pocket. First, when the incoming shock is weak, a "regular" reflection procedure is used. However, for stronger incoming shocks, we switch over to a "Mach disc" reflection procedure. Which of the two techniques is to be used must be determined by the problem at hand.

The "regular" reflection procedure utilizes a suggestion by Oswatitsch (Reference 169) that the axis of symmetry be "enlarged" near the shock impingement point so that the radial coordinate becomes small but still remains finite. The radial size of this "enlargement" is determined by the program, depending on the local strength of the shock. (Stronger shocks require more "fattening" of the axis of symmetry.) It is emphasized that these "enlargements" generally encompass less than one half of one percent of the original mass flow so that they are scarcely detectable on a "blown up" plot of the shock locus.

The "Mach disc" reflection technique (which is considerably more complicated than the "regular" reflection procedure) involves the insertion of a triple point and the use of an iterative technique to determine its location. In this analysis, a triple point is inserted at a chosen location on the shock, and the oblique shock which is moving radially inward is forced to branch into a second outward-running shock and a normal shock which extends to the axis as shown in Figure 272. The normal shock represents the Mach disc. A slip line is also generated at the "lambda" intersection. Downstream of the Mach disc, this slip line serves as a boundary between the supersonic flow and the subsonic flow. The supersonic flow is handled by the standard SSFD algorithm, while the subsonic flow is analyzed by a one-dimensional approximation. The height of this one-dimensional channel at succeeding axial locations is determined by requiring the pressure to be balanced across the slipstream, and by requiring the supersonic flow to be tangent to the slip line. This matching requirement causes the Mach number in the one-dimensional stream to vary as it flows downstream. The axial position of the Mach disc is then iteratively determined based on the behavior of the flow in this one-dimensional channel. The Mach disc is said to have been correctly positioned when the slip line forms a "throat" which reaccelerates the subsonic flow through sonic velocity in a smooth, continuous fashion. This Mach disc model is very similar to the ones used by Abbett (Reference 170), Averenkova, et al, (Reference 162),and Fox (Reference 171). Comparisons between this Mach disc model and experimental results, have shown reasonable agreement, but the iterative procedure is quite expensive (in terms of computer processing time) and tends to be unreliable. Most of the results presented in this report are based on the "regular" reflection.

CALCULATION OF THE TURBULENCE FIELD

The previous sections have described the model which is used to predict the velocity field in a nonideally expanded jet. However, before the acoustic characteristics of the jet can be determined, it is necessary to know some-

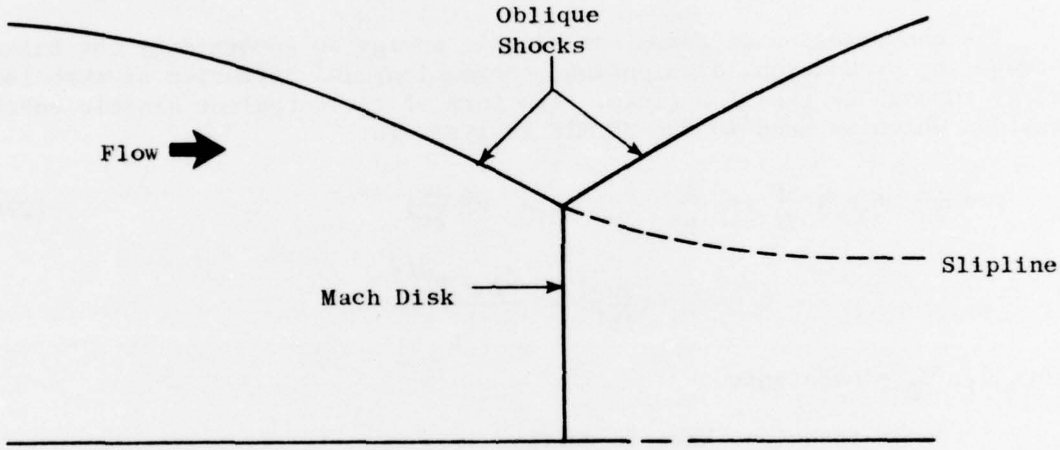


Figure 272. Mach Disk Model.

thing of the turbulence field in the jet. As indicated in Appendix 6 (or, see Reference 6), the turbulence model which is used in the JETMIX computer program is based on a turbulent kinetic energy approach. For ideally expanded jets, the magnitude of this turbulent kinetic energy has been used to evaluate the source terms in the classical Lighthill acoustic equations (Reference 10). Once these source terms are evaluated, the acoustic signature of the jet can be readily determined. Since this acoustic formulation is based on the local mean and fluctuating properties of the jet, it should also be directly applicable to nonideally expanded jets. (This, of course, does not imply that the model would predict the same acoustic radiation from ideally expanded jets, because both the mean velocity field and the turbulence field depend on the expansion ratio of the jet.) Thus, it remains to determine the turbulent kinetic energy in the nonideally expanded jet.

The conversation of turbulent kinetic energy is governed by the balance between the production, dissipation, convection, and diffusion of turbulence energy throughout the flow field. The form of the turbulent kinetic energy equation which is used in the JETMIX analysis is:

$$\rho\, u \frac{\partial e}{\partial x} + \rho\, v \frac{\partial e}{\partial y} = \frac{1}{y^{\varepsilon}} \frac{\partial}{\partial y} \left(C_1 u_t\, y^{\varepsilon} \frac{\partial e}{\partial y}\right) + \mu_t \left(\frac{\partial u}{\partial y}\right)^2 - \frac{C_2\, \rho\, e^{3/2}}{L_t} \qquad (294)$$

where C_1, C_2 = constants

e = turbulent kinetic energy
L_t = turbulent length scale
μ_t = turbulent eddy viscosity

The turbulent kinetic energy is related to the three components of fluctuating velocity by:

$$e = 1/2\, (\langle u'^2 \rangle + \langle v'^2 \rangle + \langle w'^2 \rangle) \qquad (295)$$

As used in the JETMIX analysis, equation 294 applies to ideally expanded jets. However, there is one flow phenomenon which affects the turbulence levels, and which is unique to nonideally expanded jets, that is not included in the conservation equation (294). This phenomenon is the presence of shock waves in the flow field. These effects have been included in our analysis by means of Ribner's shock-turbulence interaction model (References 172-174).

Ribner's analysis starts by decomposing the turbulence field into an infinite number of elementary vorticity waves of all wavelengths and orientations. Then for any one of these elementary waves, he calculates the manner in which the vorticity of the wave is altered as it is convected through a normal shock wave. The results of his calculation show that the magnitude of the vorticity is increased as the wave goes through the shock. (Besides the increased vorticity, two new waves are generated, an entropy wave and an acoustic wave.) A summation over all wave numbers of the effects of the shock on each individual wave then yields an amplification factor for the turbulence as it is transmitted through the shock. Conversion from turbulence convected through a normal shock to turbulence convected through an oblique shock is made by a transformation of coordinates (Figure 273). It should be noted that, although Ribner's analysis strictly applies only to straight shocks, it can also be applied to curved shocks (such as occur in supersonic jets), as long as the radius of curvature of the shock is significantly larger than the longest wavelength of the turbulence.

In Ribner's analysis, the three components of turbulence amplification are defined by:

$$\frac{\langle u_2'^2 \rangle}{\langle u_1'^2 \rangle} = 3/2 \int_0^{\frac{\pi}{2}} |s|^2 \cos^2 \theta_2 \cos \theta_1 \, d\theta_1 \qquad (296)$$

$$\frac{\langle v_2'^2 \rangle + \langle w_2'^2 \rangle}{\langle u_1'^2 \rangle} = 3/2 \left(1 + \int_0^{\frac{\pi}{2}} |s|^2 \sin^2 \theta_2 \cos \theta_1 \, d\theta_1 \right) \qquad (297)$$

Figure 274 shows the amplification of turbulence by a shock in terms of the ratio of turbulent kinetic energy in front of and behind the shock. The turbulence amplification is plotted as a function of the ratio of the normal components of velocity in front of and behind the shock. As can be seen, the amplification is unity at a velocity ratio of unity (shock of vanishing strength) but quickly increases to a maximum of some 20% amplification for moderate shock strengths (normal component of incoming Mach number about 1.5).

In our computer model, the turbulent kinetic energy is monitored at each point in the flow by means of equation (294), suitably transformed to x-ψ coordinates. When a shock wave is encountered, the turbulence amplification is determined from Ribner's theory, and the turbulent kinetic energy is increased locally by the amount of turbulence which is generated at the

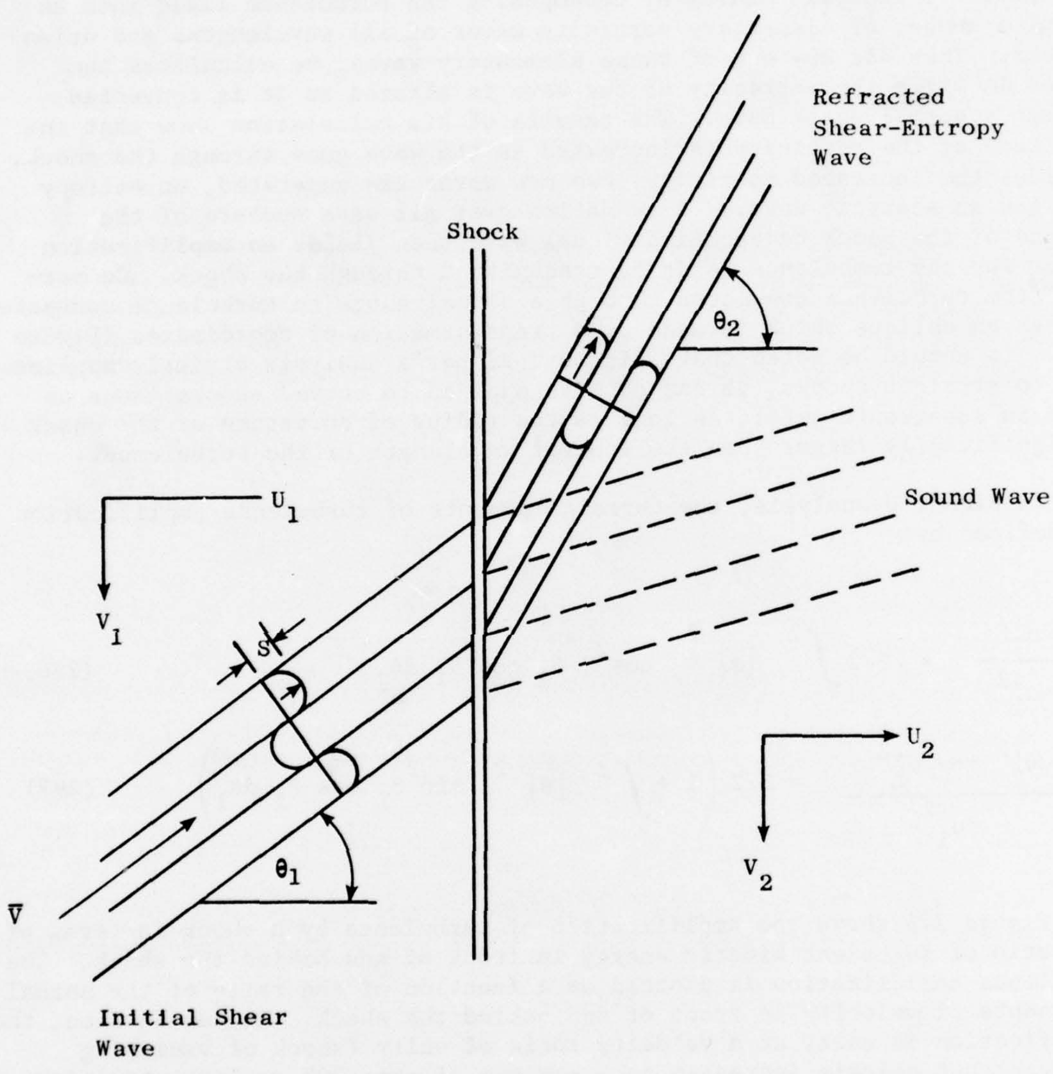


Figure 273. Passage of Turbulence Through a Shock.

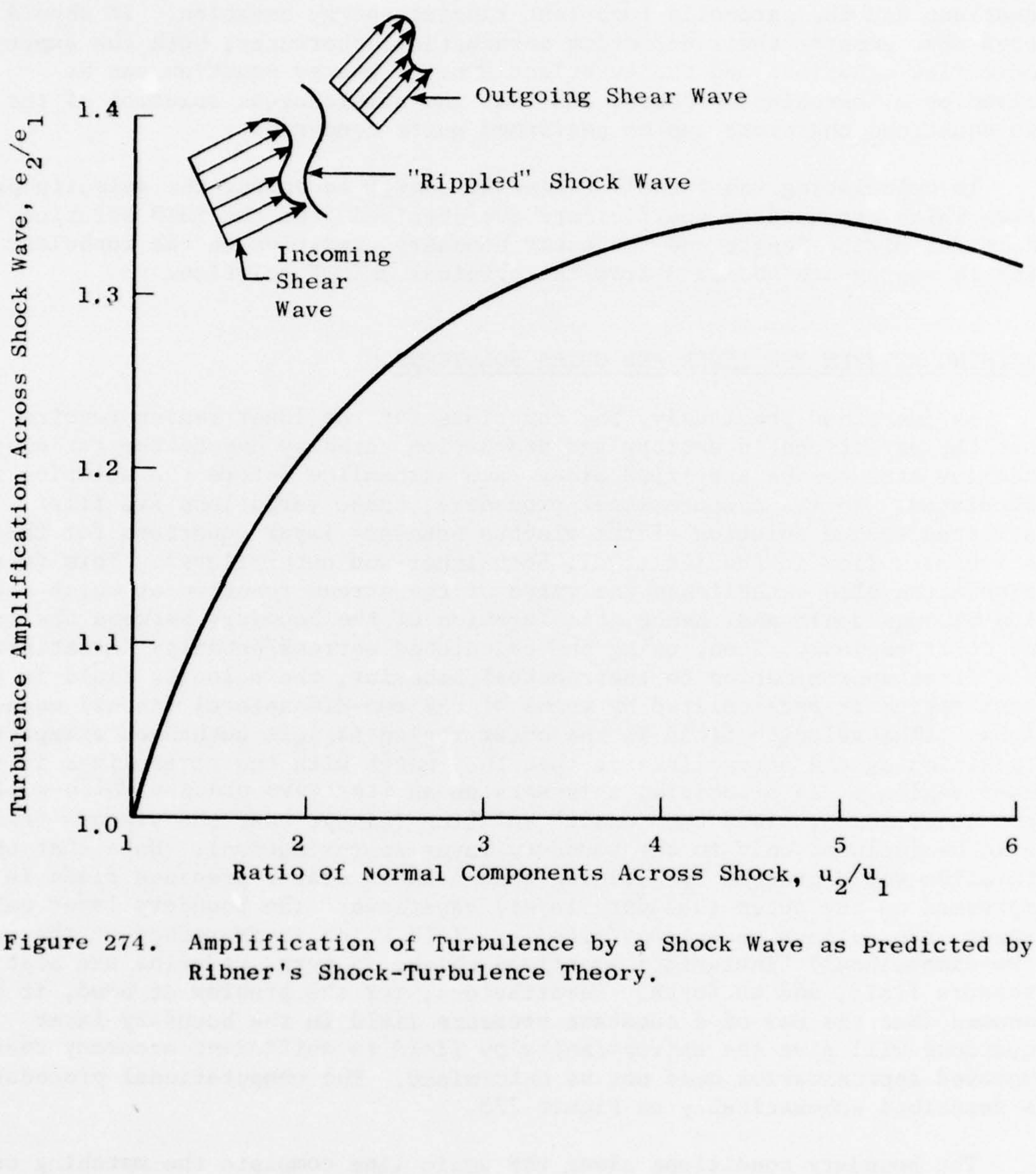


Figure 274. Amplification of Turbulence by a Shock Wave as Predicted by Ribner's Shock-Turbulence Theory.

shock. The resulting turbulence energy profiles have a discontinuous jump across the shock. Equation (294) is solved numerically using an implicit Crank-Nicholson procedure. Since this numerical algorithm is unconditionally stable, there is no restriction on the axial step size which must be used. Consequently, the step-size is determined by the supersonic flow equation, and the same (Δx) step size is used for both the hyperbolic supersonic flow equations and the parabolic turbulent kinetic energy equation. It should be noted that despite their differing mathematical character, both the supersonic flow equations and the turbulent kinetic energy equation can be solved by a "marching" process, and that the simultaneous solution of the two equations therefore can be performed quite compatibly.

In calculating the turbulent kinetic energy equation, the velocity profiles which are used as coefficients are obtained from the SSFD solution, while the mixing length and the outer boundary condition on the turbulent kinetic energy are obtained from the original JETMIX solution.

MATCHING BETWEEN THE INNER AND OUTER SOLUTIONS

As described previously, the equations for the inner region require that the variations in entropy and stagnation enthalpy due to the turbulent shearing stresses be specified along each streamline before the solution is calculated. In the computational procedure, these variations are first estimated from a solution of the viscous boundary layer equations for the entire mass flow in the jet (i.e., both inner and outer flows). This viscous calculation also establishes the value of the stream function at which the flow becomes sonic and, hence, the location of the boundary between the inner and outer regions. Then, using the calculated entropy/enthalpy variations as a first approximation to their actual behavior, the velocity field in the inner region is recalculated by means of the two-dimensional (inner) equations. (The velocity field in the outer region is left unchanged except for repositioning the streamlines so that they match with the streamlines in the inner region.) In principle, this sets up an iterative process which would, upon convergence, yield the "exact" solution (except that the viscous terms would be included only to the boundary layer approximation). Note that the iteration would proceed by assuming that a known static pressure field is impressed on the outer (boundary layer) equations. The boundary layer calculation then defines an entropy/enthalpy field which is impressed on the inner (two-dimensional) "inviscid") equations which, in turn, redefine the static pressure field, and so forth. Nevertheless, for the problem at hand, it is assumed that the use of a constant pressure field in the boundary layer equations will give the entropy/enthalpy field to sufficient accuracy that an improved approximation need not be determined. The computational procedure is described schematically on Figure 275.

The boundary conditions along the sonic line complete the matching of the inner and outer solutions. The viscous solution assumes that the static pressure is constant throughout the outer region and is equal to the ambient. At the matching (sonic) line, the static pressure in the inner region is

Outline of Complete Computational Scheme

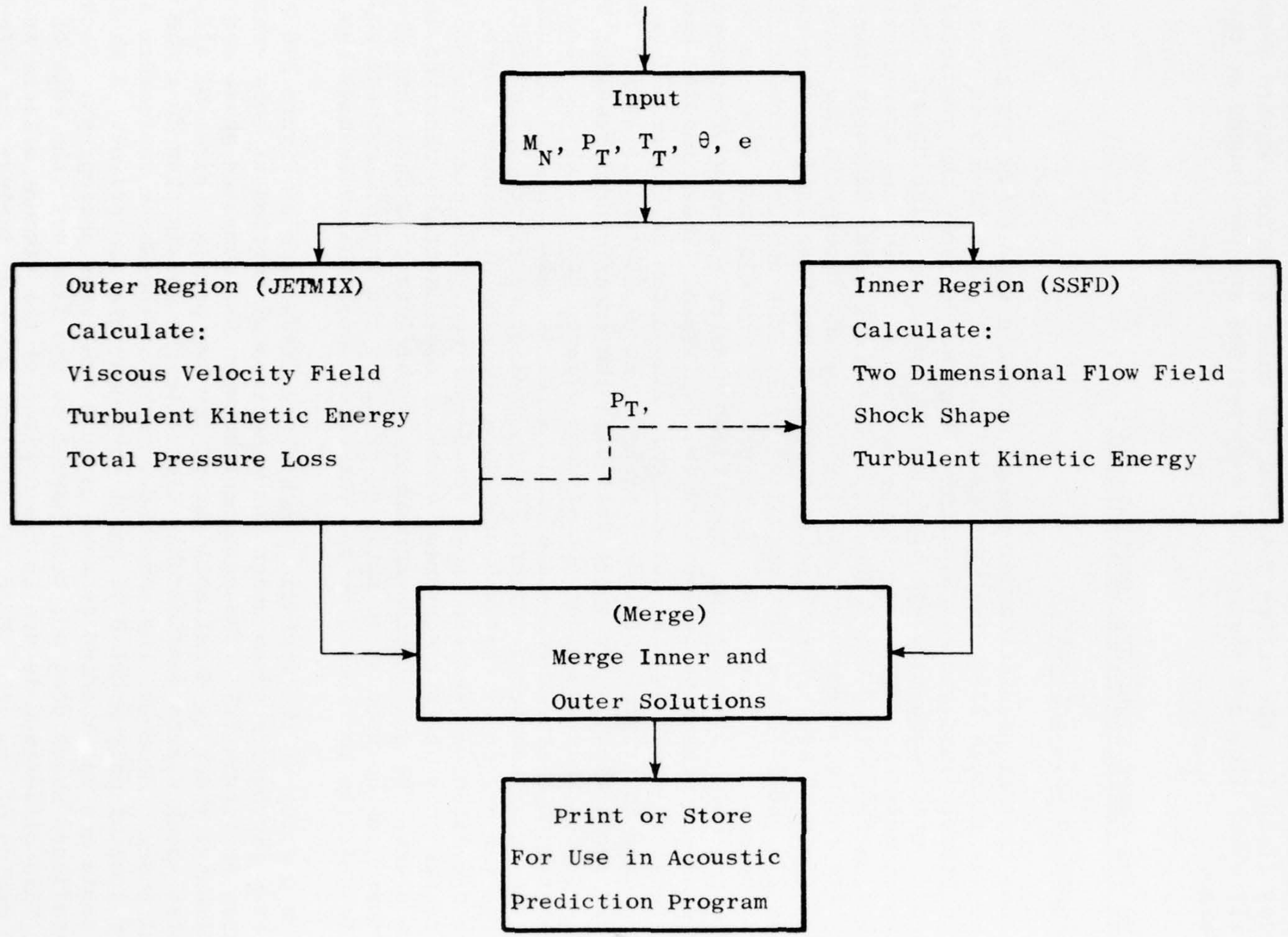


Figure 275. Outline of Complete Computational Procedure.

required to approach the ambient pressure. Thus, by requiring the static pressure to be continuous across the sonic line, and by obtaining the entropy/enthalpy field for the entire jet from the outer solution, we are assured that all other flow and thermodynamic properties are continuous at the interface also.

RESULTS FOR SHOCK STRUCTURE COMPUTATIONS

Inviscid Calculations

Some typical predictions of the aerodynamic flow field are given in Figures 276 through 279. The results in these figures have been obtained from completely inviscid calculations. Figure 276 shows the predicted shock shape and outer boundary shape based on the inviscid calculation. The shock originates near the outer edge of the jet due to coalescing characteristics coming from the curved outer boundary. The shock moves radially inward and eventually reflects from the axis of symmetry and returns to the outer boundary. The "regular" reflection technique has been used in this case. Figures 277 and 278 show the composite result of a number of computations similar to that of Figure 276. In Figure 277 the distance from the nozzle exit to the point at which the shock first crosses the axis of symmetry is plotted as a function of pressure ratio, P_{jet}/P_{amb}. These results are for both "regular" and Mach disc reflection. Also shown on Figure 277 is a line representing the experimental data of Love, et al (Reference 168). The inviscid predictions agree quite well with the experimental results; however, this is to be expected, since the viscous effects don't start to have significant effects on the shock shape until after it reflects from the axis and nears the outer boundary. Figure 278 is similar to Figure 277 except that it shows the height of the Mach disc as a function of pressure ratio. Again, Love's experimental data are shown for comparison. The predicted Mach disc heights are only in fair agreement with the experimentally observed values. Nevertheless, the qualitative agreement is sufficient to show that the Mach disc model can be used as an artifice to allow the two-dimensional supersonic flow calculation to proceed beyond the point where the shock hits the axis.

An overlay of the inviscid shock shape prediction of Figure 276 with a Schlieren photograph taken under the experimental portion of this contract, is shown as Figure 279. The agreement between the computed shock and the experimental shock is excellent, except for two points. First of all, the computed shock starts considerably closer to the nozzle than does the experimental shock. However, the computed version of the shock represents a Mach number jump of only about 0.02 until very near the centerline. A shock this weak would not be expected to show up on a Schlieren photograph. Secondly, the predicted shock does not turn normal to the flow near the edge of the jet. This difference is due to the neglect of the viscous effects in the outer region of the jet. Some calculations which do include the effects of viscous mixing are shown in the next section.

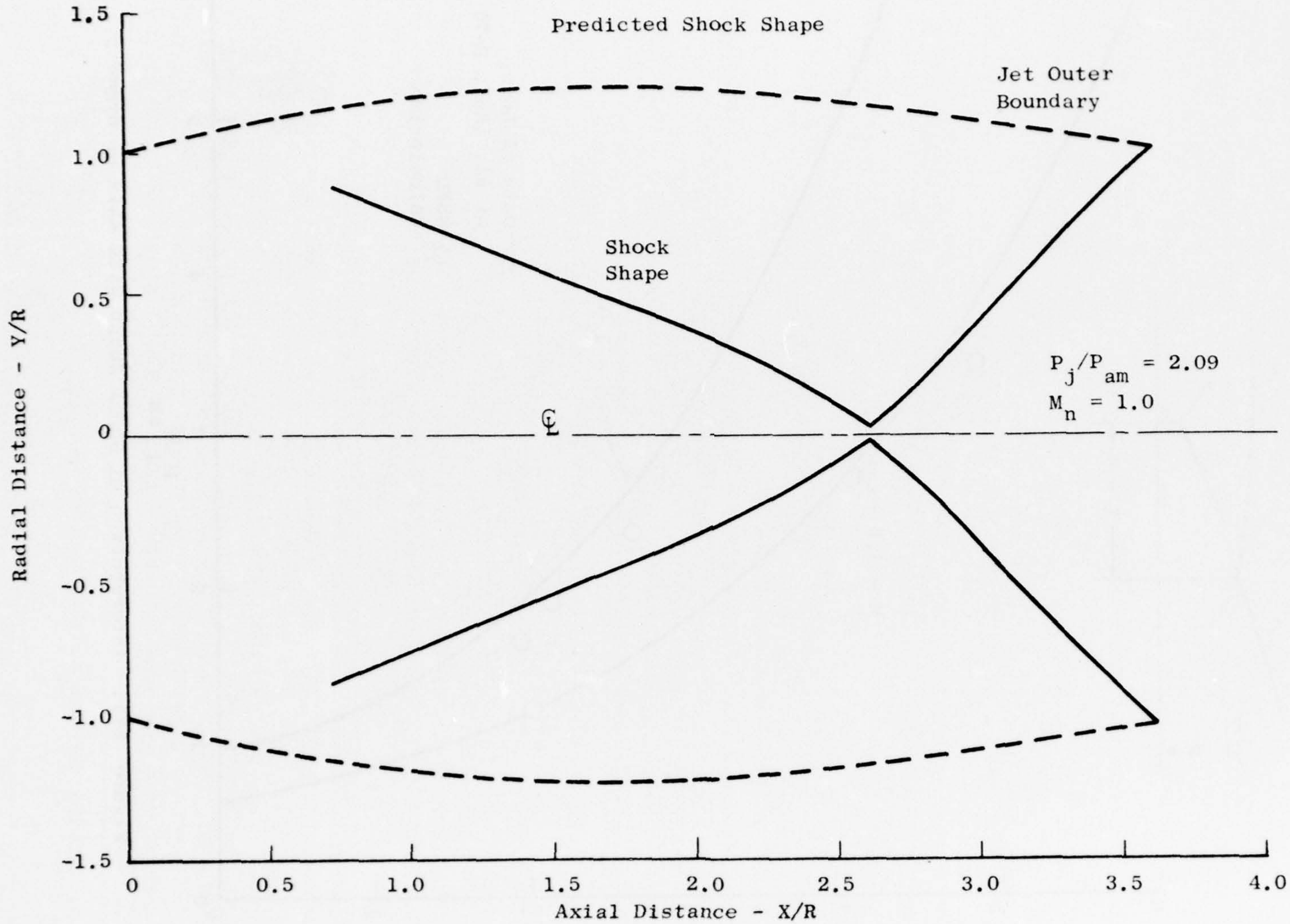


Figure 276. Predicted Shock Shape and Outer Boundary Shape -- Inviscid.

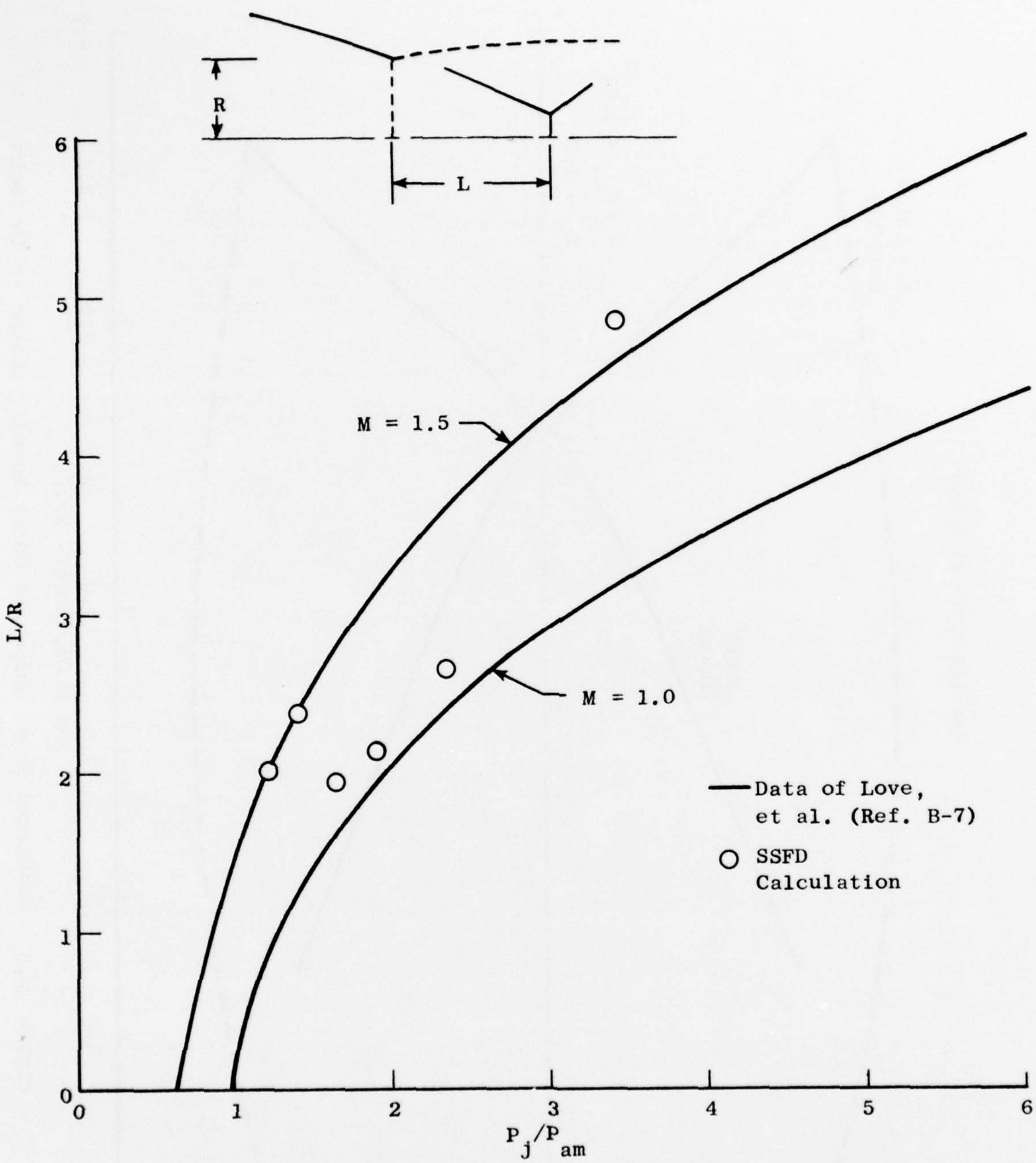


Figure 277. Intersection of Shock Shape with Axis of Symmetry.

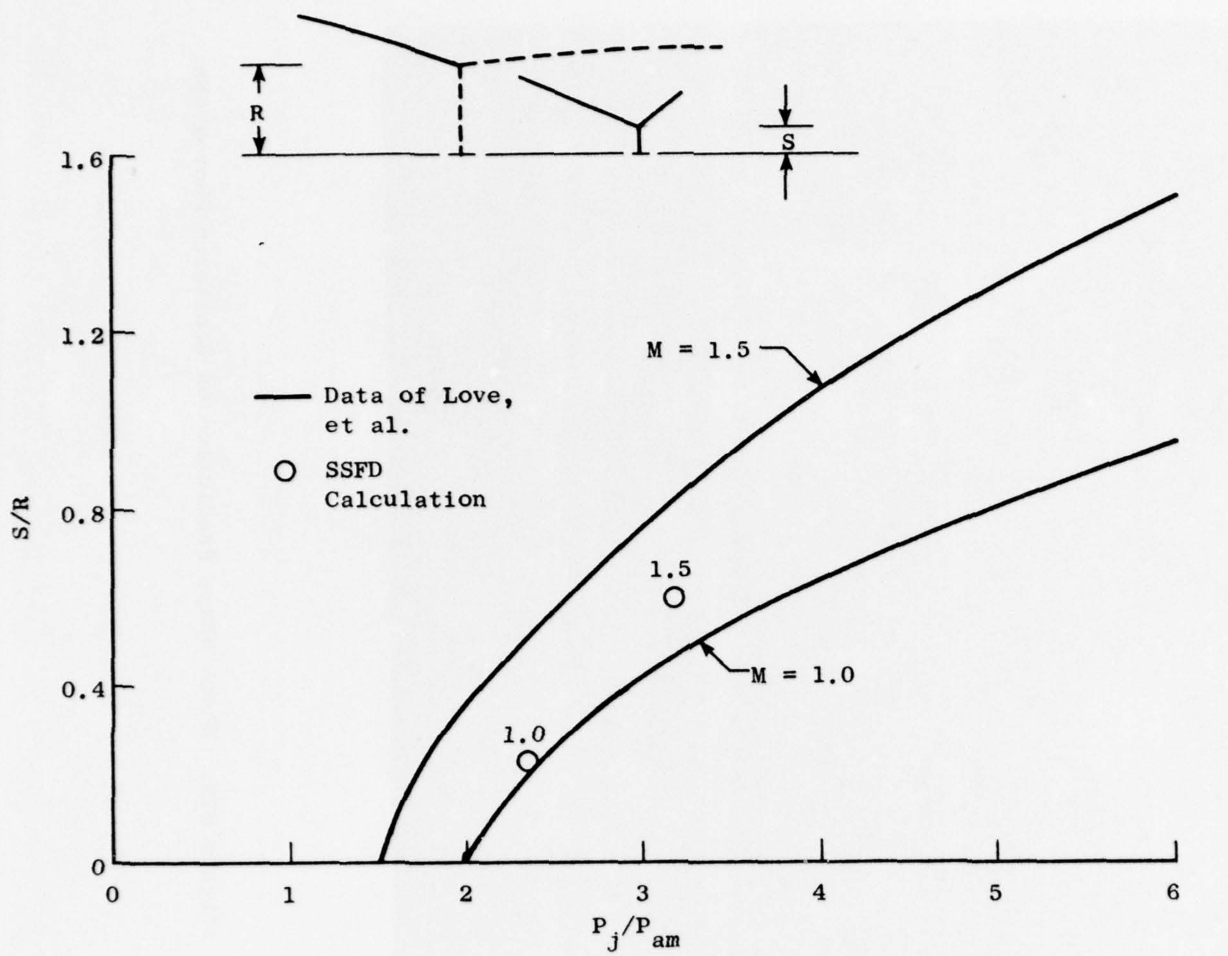


Figure 278. Height of Mach Disk.

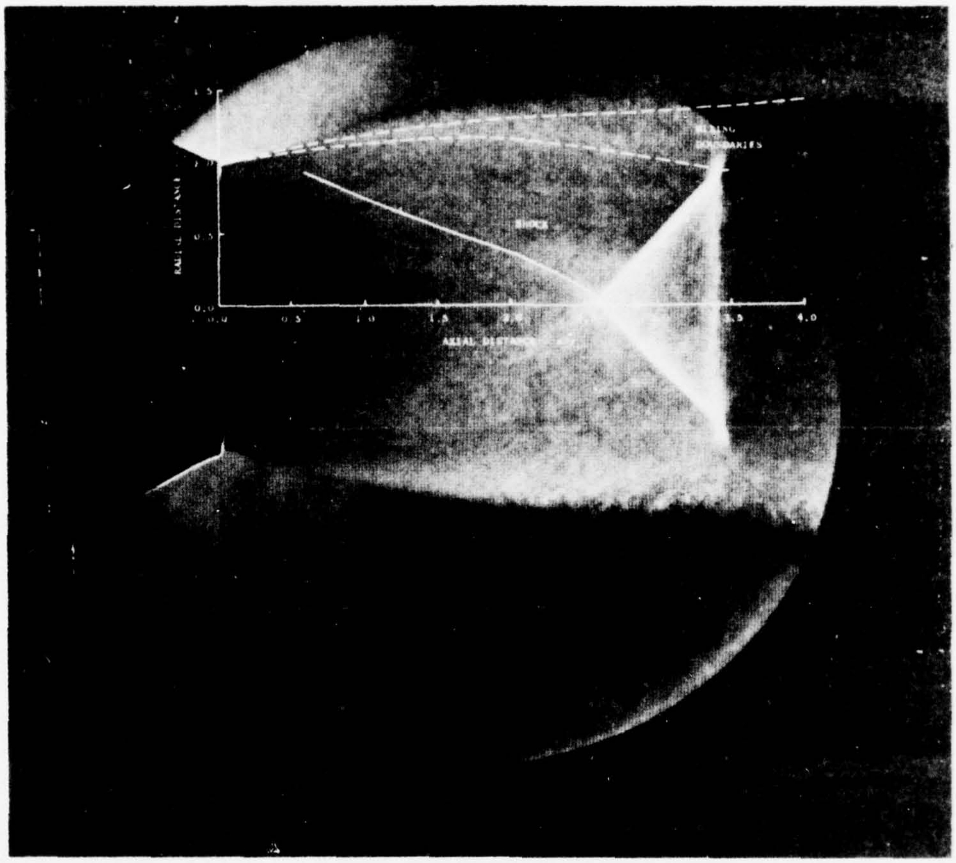


Figure 279. Shock Shape Prediction on Schlieren Photograph.

Turbulent Flow Field Calculations

Figures 280 through 285 present the results of calculations based on the fully coupled viscous-inviscid analysis. Figures 280, 281, and 282 show the effect of varying amounts of underexpansion on a jet plume. In all three figures, the total-to-ambient pressure ratio, $P_T/P_{amb} = 4.10$. The static-to-ambient ratio, P_J/P_{amb}, is, however, different in each figure. Figure 280 shows the radial variation of both the total pressure and the static pressure for the ideally expanded jet, $P_J/P_{amb} = 1.0$. Here, the pressure is constant (and equal to the ambient) throughout the entire jet. Consequently, both the complete inner-outer analysis and the purely boundary layer analysis give identical results for this case. At the axial locations shown, $x/R = 1.90$ and 2.35, the total pressure near the centerline of the jet has remained at its original upstream value, indicating that the inviscid core is still present. Near the outer edge of the jet, the total pressure falls off quite rapidly due to mixing. This decrease continues until the total pressure approaches the static (ambient) pressure signifying that the velocity has dropped to zero.

A slightly underexpanded jet ($P_J/P_{amb} = 1.6$) is shown in Figure 281. This flow field contains a weak shock, which, at the axial location shown, $x/R = 2.65$, has just reflected from the axis of symmetry and is moving back toward the outer boundary. Because of the shock, there are now two sources of total-pressure loss. Since the shock has already reflected from the axis of symmetry, the flow in the center of the jet has experienced a finite, shock-induced total-pressure loss as shown by the smaller shaded region. Between this region and the outer mixing-loss region (also shown shaded) lies a portion of the gas which is unaffected by mixing and has been traversed by only a very weak shock so that its total pressure remains equal to its upstream value. The radial variation of the static pressure is no longer trivial in this case as it was in Figure 280. The pressure near the center is relatively high, then drops across the shock to a below-ambient value and finally asymptotically approaches the ambient value at the interface between the inner and outer regions. The location of this interface, as well as the location of the sonic point, is also shown in Figure 281.

The last figure of this series represents a still larger degree of underexpansion than did Figure 281. Figure 282 corresponds to flow from a convergent nozzle with sonic velocity at the exit. The pressure ratio is $P_J/P_{amb} = 2.1$. This figure again shows radial variations of both total and static pressures at each of two axial stations, $x/R = 1.90$ and $x/R = 2.65$. The rate at which the mixing region spreads with distance from the nozzle exit can again be seen, as can the increasing total-pressure loss due to shocks. Note the relatively large levels of static pressure variation, even though the underexpansion is still mild. Finally, note that the viscous boundary layer analysis by itself would predict the same flow field for all three jets in Figures 281 and 282, (assuming the impressed pressure were taken as the ambient pressure in all cases). Also note that the considerable effect of the mixing-induced total-pressure loss on the flow field would be ignored by pure inviscid analyses.

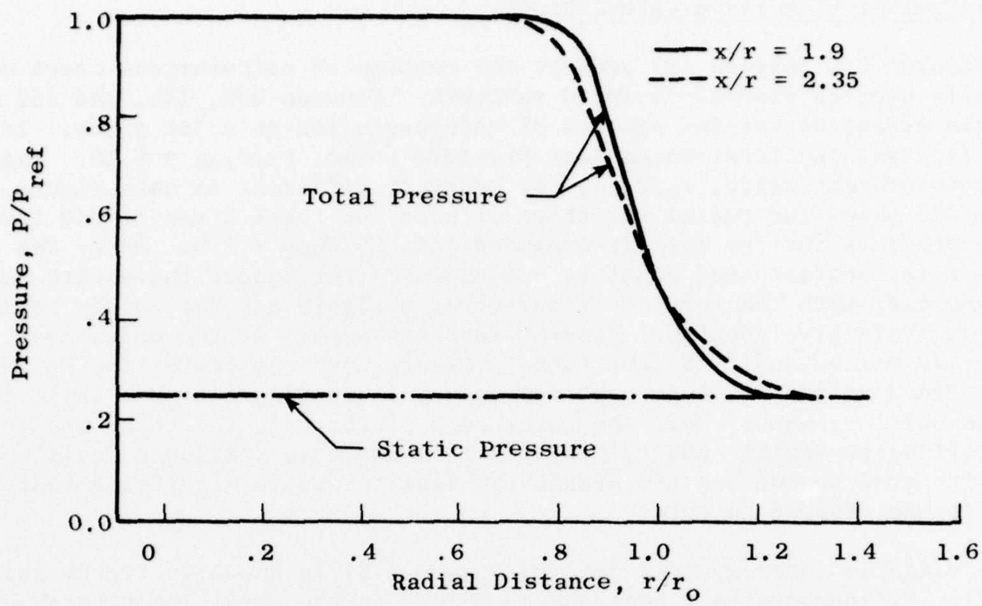


Figure 280. Cross-Stream Variation of Predicted Total Pressure and Static Pressure for Ideally Expanded Jet. $M_{exit} = 1.60$, $P_{amb}/P_{Tref} = 0.242$

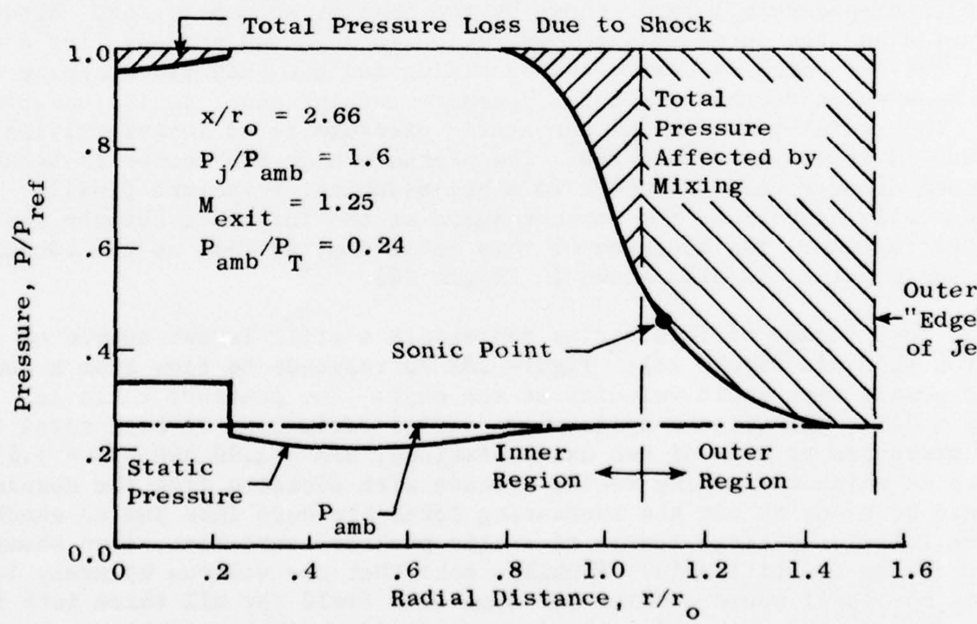


Figure 281. Cross-Stream Variation of Predicted Total Pressure for Slightly Underexpanded Jet. Showing Total Pressure Loss Due to Both Shocks and Mixing. $M_{exit} = 1.25$, $P_{amb}/P_{Tref} = 0.242$

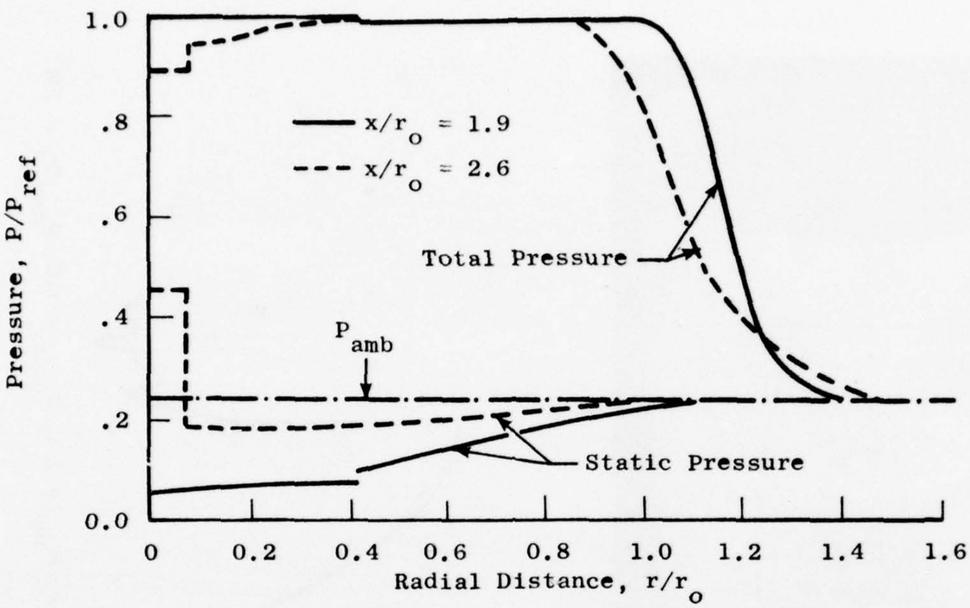


Figure 282 . Cross-Stream Variation of Predicted Total Pressure for Jet from Convergent Nozzle, Showing Total Pressure Loss Due to Both Shocks and Mixing, $M_{exit} = 1.0$, $P_{amb}/P_{Tref} = 0.242$.

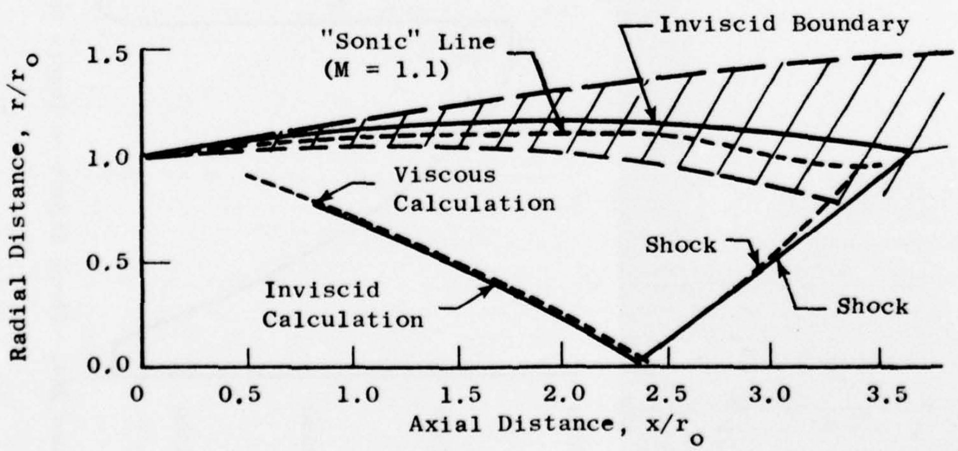


Figure 283. Comparison Between Predicted Shock Shapes Using Inviscid Prediction Technique and Coupled (Inner-Outer Analysis) Viscous Technique. Shaded Region Represents Flow Which is Significantly Affected by Mixing, $M_{exit} = 1.25$, $P_{amb}/P_{Tref} = 0.242$.

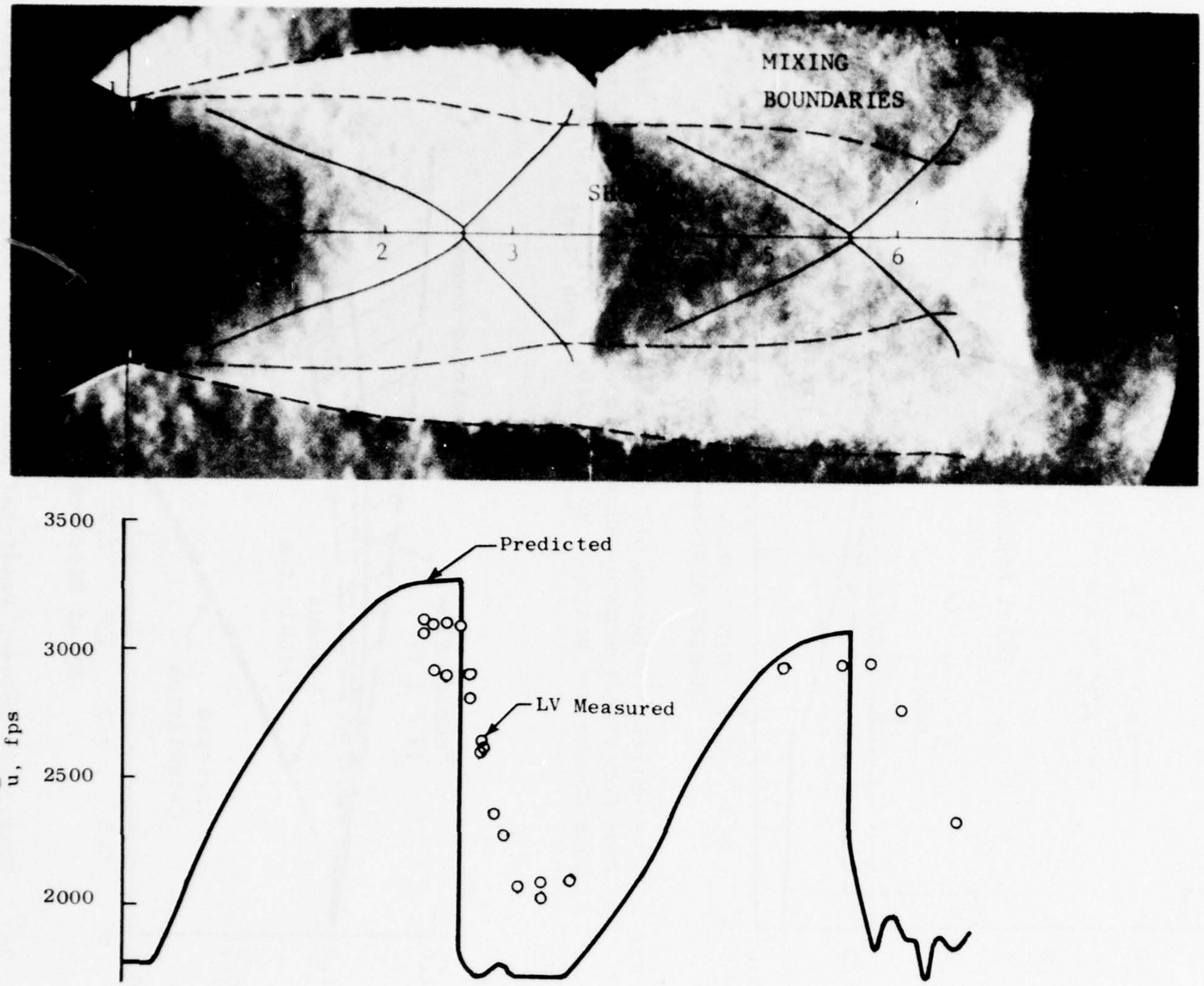


Figure 284. Shock Structure Theory Data Comparison, $P_j/P_{amb} = 2.1$, $M_{exit} = 1.0$, $P_{amb}/P_T = .24$.

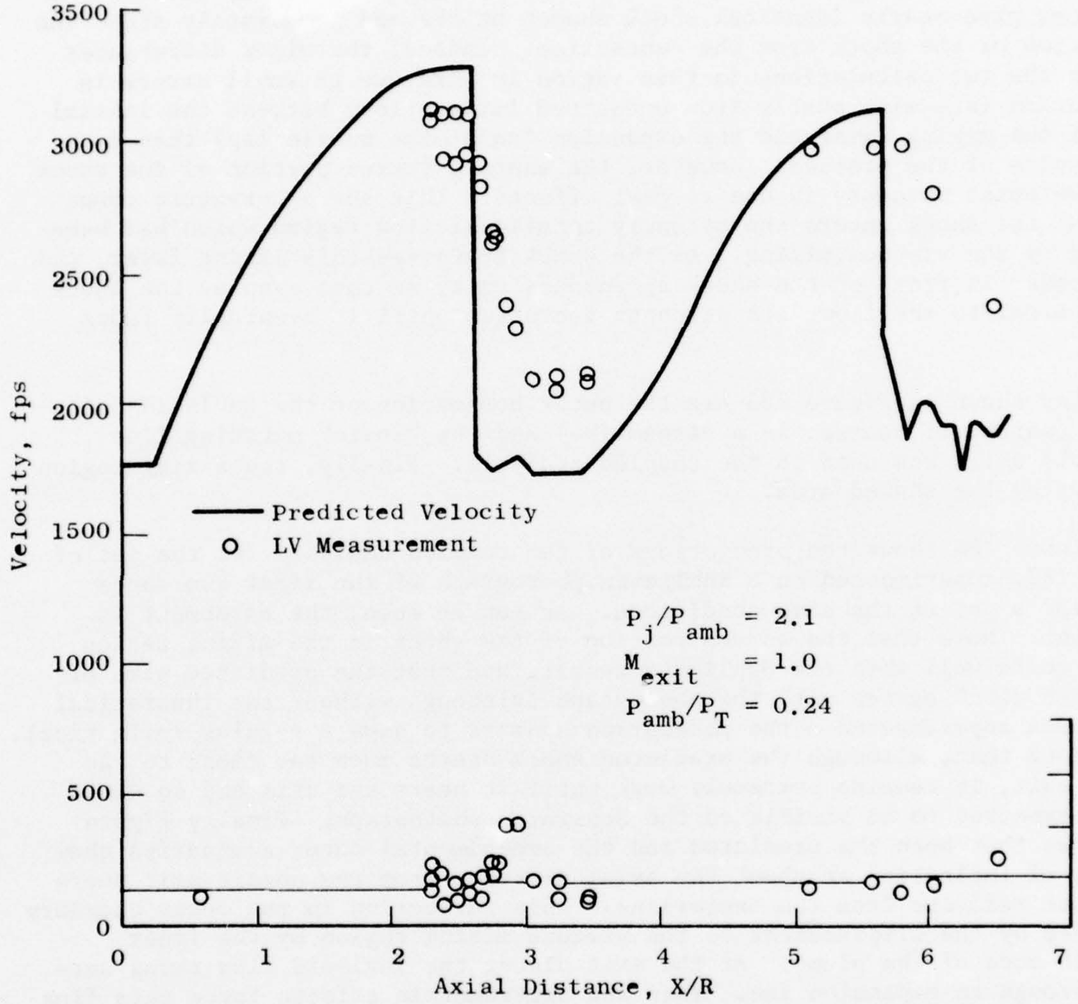


Figure 285. Mean Velocity and Turbulence Velocity on Centerline.

The next two figures show the predicted shock-wave shapes for the jets of Figures 281 and 282. Figure 283 shows a comparison between the shock shape which is predicted by the complete inner-outer analysis and the shape predicted by a completely inviscid analysis for the jet of Figure 281. The inviscid calculation was made by specifying the entropy to be constant along all streamlines (except for shock losses). As Figure 283 shows, the two calculations give nearly identical shock shapes before and immediately after the reflection of the shock from the centerline. Indeed, the minor differences between the two calculations in this region is more due to small errors in calculation (stemming mostly from undesired interactions between the initial part of the mixing layer and the expansion fan at the nozzle lip) than from the physics of the problem. However, the sharply curved portion of the shock near the outer boundary is due to real effects. This sharp curvature comes about as the shock enters the strongly rotational flow region which has been created by the viscous mixing. As the shock traverses this mixing layer, the Mach number in front of the shock approaches unity so that even as the shock turns normal to the flow, its strength decreases until it eventually fades out.

Also shown in Figure 283 are the outer boundaries of the inviscid calculation (which, of course, is a streamline) and the "sonic" matching line ($M = 1.1$) which was used in the coupled analysis. Finally, the mixing region is shown by the shaded area.

Figure 284 shows the predictions of the coupled analysis for the jet of Figure 282. superimposed on a Schlieren photograph of the first two shock waves for a jet at the same conditions. As can be seen, the agreement is excellent. Note that the curved portion of the shock in the mixing region agrees quite well with the Schlieren result, and that the predicted size of the "Mach disc" agrees with the photograph (although without the theoretical prediction superimposed - the photograph appears to show a regular reflection). Again note that, although the predicted shock starts much too close to the nozzle exit, it remains extremely weak until it nears the axis and so would not be expected to be visible on the Schlieren photograph. Finally Figure 284 shows that both the predicted and the experimental outer boundaries show a point of inflection at about the axial distance from the nozzle exit where the shock reflects from the centerline. This inflection in the outer boundary is caused by the displacement of the viscous mixing region by the inner inviscid core of the plume. At the exit plane, the inviscid flow turns outward through an expansion fan. Then the axisymmetric effects force this flow to again turn and approach the axis (see outer boundary shape of the inviscid calculations in Figure 276). The superposition of an everwidening mixing region on these curved inviscid streamlines generates the inflection of the boundary.

Figure 285 shows the predicted axial variation of mean and turbulence velocity on the centerline for the jet of Figures 282 and 284 ($P_J/P_{amb} = 2.1$). Also shown are laser velocimeter measurements of the mean and turbulent velocity distributions. What is noticed in both the analytical predictions and the data is that the mean velocity has a wide excursion (over and below)

about the ideal isentropic velocity for this nozzle, while the turbulence velocity distribution remains relatively uniform. On the average, the mean velocity distribution may be equivalent (in an acoustical sense) to the ideal velocity distribution. If the shock waves have little influence in turbulence amplification as observed in the centerline case, these two factors may combine to give a reason why shock-free and shocked flow acoustic characters on an overall basis are essentially the same.

APPENDIX 8

ANALYSIS INCORPORATED IN NOISE

Over the last two decades, a considerable amount of theoretical and experimental research effort has been directed toward investigating sound generating mechanisms in subsonic and supersonic jets. As a result, several distinctly different theoretical schemes have been advanced to describe the jet noise generation problem. Most of the schemes are intended to deal with the same general concept (that of a finite region of turbulent flow surrounded by a uniform, homogeneous, stationary, acoustic medium), while other schemes deal with the jet stability and nonlinear properties.

The first scheme was introduced by Lighthill. He described the sources of sound in turbulent flow by means of an acoustic quadrupole distribution in a uniform medium at rest. Undoubtedly, Lighthill's theory has exerted the most profound influence on the subject. Ribner, Ffowcs-Williams, and many others have followed this method of attack and have made significant contributions to the theory. Mathematically, Lighthill's acoustic analogy has reduced the aerodynamic noise problem to essentially the solution of the classical wave equation with a forcing term. The fundamental result of the theory can be expressed in the form of the retarded potential solution:

$$a_o^2(\rho-\rho_o) = \frac{1}{4\pi} \int_V \frac{(x_i-y_i)\ (x_j-y_j)}{|x - y|^3} \frac{\partial^2}{\partial t^2} T_{ij}\left(y, t - \frac{|x-y|}{a_o}\right) d^3y \qquad (298)$$

where:

$$T_{ij} = \rho u_i u_j + \tau_{ij} + (p - a_o^2\ \rho)\ \delta_{ij}$$

This equation represents the instantaneous radiated sound pressure $p' = a_o^2\ (\rho - \rho_o)$ in terms of turbulent fluctuations in the jet flow. Many conclusions of the theory have already been verified experimentally and some of the observed characteristics of jet noise are explained by Lighthill's theory. For example, References 1 and 10 have demonstrated how Lighthill's model (modified for supersonic flow) can be applied to spectral predictions of supersonic jets.

However, Lighthill's theory is not without limitation. One of the difficulties is that it does not effectively account for the refractive or coupled convective/refractive properties of sound. In this respect, Ribner (Reference 175) and Schubert (Reference 176) have attempted to offer some improvements. Mani (References 20 and 177) has illustrated that more realistic moving sources exist which can explain more clearly the influences of the jets shrouding influences on aerodynamic noise.

A second approach has been advanced independently by several authors (References 178-180) based on the method of matched asymptotic expansions. In Lighthill's fundamental solution (see equation 298), the instantaneous sound pressure $p' = a_o^2 (\rho - \rho_o)$ is given in terms of the quadrupole strength T_{ij}, which involves the unknown density fluctuation. However, in Lighthill's acoustic analogy, the quadrupole strength T_{ij} is regarded as a known quantity. The essence of Lighthill's approach, therefore, is that the density fluctuation in T_{ij} can reasonably be ignored. This approximation has been considered as rather unsatisfactory in some quarters and has led several investigators to examine the problem on the basis of matched asymptotic expansions. Using inner and outer expansions to describe respectively the turbulent and sound fields, they concluded that Lighthill's neglect of the density fluctuation in T_{ij} indeed gives the first term of an asymptotic expansion for the density field. While higher approximations have yet to be generated, these studies have clearly illustrated that there are limitations in the acoustic analogy scheme.

A third approach applicable to the jet noise problem was given by Phillips (Reference 21) on noise generation from supersonic shear layers. He formulated the problem in such a way that the effects of convection and variation in the local speed of sound are displayed explicity; whereas, in Lighthill's acoustic analogy, they were described in the source term. Therefore, an important issue for supersonic flow - the refraction of sound in travelling from its point of generation through velocity and temperature gradients into the ambient air is taken into account in this formulation. Furthermore, the problem of neglecting the density fluctuations in the source term in Lighthill's approach does not arise in the formulation. Pao (Reference 181) has presented a generalization of the Phillip's theory in which the range of validity has been extended to include the low supersonic and transonic ranges.

A fourth method of attack was proposed by Liepmann (Reference 182). This scheme is to extend the principle established in steady viscous flow analysis, i.e., that the flow external to a body is that established in an ideal potential flow around the hypothetical body formed when the boundary-layer displacement thickness supplements the real body dimension. Liepmann proposed that the radiation field could be driven by an ideal boundary faithfully following the profile of the instantaneous displacement thickness. The concept is sound; however, all the emphasis is placed on the computation of the instantaneous displacement thickness - a very difficult task. Laufer, Ffowcs-Williams, and Childress (Reference 183) have made probably the most comprehensive attempt at solving this scheme.

A fifth new approach is based on the concepts of the existence of large-scale instabilities in jet flows. From the earlier work of Landau (Reference 184) on the plane vortex sheet problem, Sedelnikov's (Reference 185) eddy Mach wave concept based on instability waves in oscillating jet boundaries, to the more recent instability theories of Tam (References 80 and 186), it is becoming more possible that instability concepts could be useful in the understanding of the heretofore unexplored physical aspects of supersonic

and subsonic jet noise. From numerous aerodynamic experimental investigations (References 11, 34, 46, 187, and others), the existence of these low frequency instability waves cannot be denied. However, to date there has been no clear cut acoustic experimental evidence illustrating by how much, if any, these instability waves influence the acoustic radiation field.

Of all the techniques described, the basic turbulent mixing concepts which rely on the jet being composed of compact quadrupole sources (in the Lighthill, Ribner, Flowcs-Williams sense) modified by inclusion of the jets fluid shrouding, as proposed by Mani, offered the most unified aeroacoustic predictive scheme. Described below is an account of the basic turbulent mixing acoustic analysis contained in NOISE and how it can be used for predictive purposes.

GOVERNING EQUATIONS

Without restrictions, we postulate a general fluid motion in a continuous medium being governed by the conservation equations of mass and momentum and by the equation of state:

$$\frac{\partial \rho}{\partial t} + \mathrm{div}\,(\rho\vec{u}) = o \tag{299}$$

$$\frac{\partial \rho \vec{u}}{\partial t} + \mathrm{div}\,(\rho\vec{u}\vec{u}) = \mathrm{div}\,\bar{\bar{\tau}} + \rho f_B \tag{300}$$

$$\rho = \rho\,(p,S);\; d\rho = \left.\frac{\partial \rho}{\partial p}\right)_s d_p + \left.\frac{\partial \rho}{\partial s}\right)_p ds \tag{301}$$

where:

$$\left.\frac{\partial p}{\partial \rho}\right)_s = a^2$$

$$\bar{\bar{\tau}} = -p\bar{\bar{I}} + \bar{\bar{\tau}}'$$

f_B = Body forces

τ = Viscous stress tensor

Lighthill's original idea was to combine two equations similar to equations 299 and 300 in order to derive a wave equation for the fluid density ρ. Ribner formulated an equivalent equation with p replacing ρ as the dependent variable. to do this, we take the time derivative of (298) and the divergence of (299) and subtract:

$$\frac{\partial^2 \rho}{\partial t^2} - \nabla^2 p = \text{Div Div } (\rho \overleftrightarrow{uu} - \overline{\overline{\tau}}') \tag{302}$$

Adding $a_o \nabla^2 \rho$ to both sides of (302) yields:

$$\frac{\partial^2 \rho}{\partial t^2} - a_o^2 \nabla^2 \rho = \text{Div Div } (\rho \overleftrightarrow{uu} - \overline{\overline{\tau}}') + \nabla^2 (p - a_o^2 \rho) \tag{303}$$

or similarily adding $\frac{1}{a_o^2} \frac{\partial^2 p}{\partial t^2}$ to Equation 302 yields:

$$\frac{1}{a_o^2} \frac{\partial^2 p}{\partial t^2} - \nabla^2 p = \text{Div Div } (\rho \overleftrightarrow{uu} - \overline{\overline{\tau}}') + \frac{1}{a_o^2} \frac{\partial^2}{\partial t^2} (p - a_o^2 \rho) \tag{304}$$

Equations 303 and 304 can be expressed in index notation as:

$$\frac{\partial^2 \rho}{\partial t^2} - a_o^2 \frac{\partial^2 \rho}{\partial x^2_i} = \frac{\partial^2}{\partial x_i \partial x_j} (\rho u_i u_j - \tau'_{ij}) + \frac{\partial^2}{\partial x_i^2} (p - a_o^2 \rho) \tag{305}$$

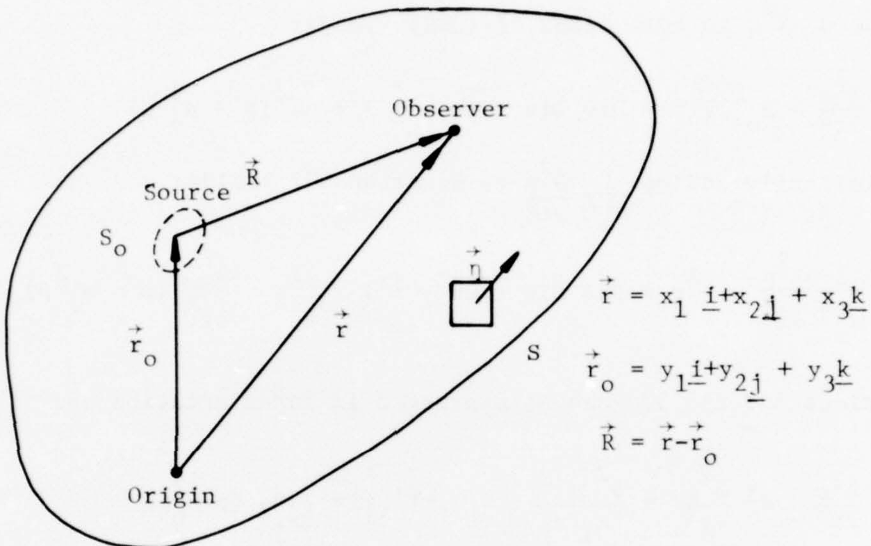
and,

$$\frac{\partial^2 p}{\partial t^2} - \frac{\partial^2 p}{\partial x_i^2} = \frac{\partial^2}{\partial x_i \partial x_i} (\rho u_i u_j - \tau'_{ij}) + \frac{1}{a_o^2} \frac{\partial^2}{\partial t^2} (p - a_o^2 \rho) \tag{306}$$

Far from the flow region of the jet itself, the right-hand-side of equations 303 through 306 must vanish identically leaving the well-known homogeneous wave equation, which, under homogeneous isentropic conditions, governs linear acoustics in a uniform medium of rest - the implied "acoustic analogy." One can now imagine the medium as being at rest at any point in space and interpret all the additional effects caused by the flow as a result of inhomogeneities which are continuously distributed throughout a limited part of the medium. By neglecting the last right-hand term of equations 303 through 306, the sound attenuation and variation in the speed of sound are neglected.

GENERAL INTEGRAL OF THE WAVE EQUATION

The formal transformation of the differential equations such as presented by equations 303 through 306 into an integral equation may be performed using the well-known Kirchhoff integral. For the pressure perturbation field we may write:



Sketch of Coordinate System

$$p'(\vec{r},t) = (p-p_o) = \underbrace{\frac{1}{4\pi R}\iiint \mathrm{Div}_o\ \mathrm{Div}_o\ [\bar{\bar{T}}]\ dV_o}_{\text{Noise resulting from fluctuating shearing stresses}}$$

$$+ \underbrace{\frac{1}{4\pi R}\iint \left\{ \left[\frac{\partial p}{\partial \eta_o}\right] + \frac{[p]}{R}\frac{\partial R}{\partial \eta_o} + \frac{1}{a_o}\left[\frac{\partial p}{\partial t}\right]\frac{\partial R}{\partial \eta_o} \right\} dS'_o}_{\text{Noise resulting from the effect of solid boundaries on the flow}} \tag{307}$$

where the bracket, [ ], means evaluation at the retarded time $t - R/a_o$ (the finite time for the sound emitted to travel the distance R from the source to the observer), and the tensor $\bar{\bar{T}}$ is the Lighthill tensor $[\rho\bar{u}\bar{u} - \tau' + (p - a_o^2\,\rho)\ \bar{\bar{I}}]$.

Neglecting the influences from solid bodies, (307) may be written in index notion as:

$$p'(\vec{r},t) = \frac{1}{4\pi}\iiint \frac{1}{R}\,\frac{\partial^2 Tij}{\partial y_i \partial y_i}\, dV_o \tag{308}$$

noting that,

$$\frac{\partial}{\partial x_i}\left(\frac{1}{R}\,[\ldots]\right) + \frac{\partial}{\partial y_i}\left(\frac{1}{R}\,[\ldots]\right) = \frac{1}{R}\left[\frac{\partial \ldots}{\partial y_i}\right]$$

and the integral divergence theorem:

$$\iiint \frac{\partial}{\partial y_i} \ldots\, dV_o = \iint \ldots\, dS_o$$

equation 308 becomes:

$$p'(\vec{r},t) = \frac{1}{4\pi}\left\{\frac{\partial^2}{\partial x_i \partial x_j}\iiint \frac{1}{R}\,[T_{ij}]\, dV_o + \frac{\partial}{\partial x_i}\iint \frac{1}{R}\,[T_{ij}]\, dS_o + \iint \frac{1}{R}\left[\frac{\partial T_{ij}}{\partial y_i}\right] dS_o\right\} \tag{309}$$

The first term on the right-hand side of (309) represents Lighthills integral for an unbounded flow, as an equivalent quadrupole distribution. The other surface integrals would contribute to back reaction of a solid body to continuous flow (the impact of sound waves from the quadrupole distribution on the solid surface to hydrodynamic flow). This development concerns the first term only:

$$p'(\vec{r},t) = \frac{1}{4\pi}\,\frac{\partial^2}{\partial x_i \partial x_j}\iiint \frac{1}{R}\,[T_{ij}]\, dV_o \tag{310}$$

Carrying out the double differentiation under the integral sign, the instantaneous sound pressure due to the distribution of quadrupoles becomes:

$$p'(\vec{r},t) = \frac{1}{4\pi}\iiint \left[\frac{(x_i-y_i)(x_j-y_j)}{R^2}\left(\frac{\ddot{T}_{ij}}{Ra_o^2} + 3\,\frac{\dot{T}_{ij}}{R^2 a_o} + 3\,\frac{T_{ij}}{R^3}\right) - \delta_{ij}\left(\frac{\dot{T}_{ij}}{R^2 a_o} + \frac{T_{ij}}{R^3}\right)\right] dV_o \tag{311}$$

where the dot denotes partial differentiation with respect to time, and the stress T_{ij} and its derivatives are evaluated at the retarded time $t - R/a_o$. In this form, the far-field sound pressure term is $\ddot{T}_{ij}/R$, the induction near-field sound pressure terms are represented by T_{ij}/R^3, and T_{ij}/R^2 terms are for the transition near-field.

APPROXIMATION FOR THE FAR-FIELD TURBULENT MIXING NOISE

To evaluate the acoustic intensity involves squaring (311) and time averaging the product. The evaluation of such a term is a formidable task. For the far-field terms, Lighthill pictured the turbulent flow divided into regions such that strengths of quadrupoles within any one region are correlated perfectly, but strength at points in different regions are uncorrelated. The extent, ℓ, of each independent quadrupole distribution is assumed to be roughly the size of the energy-bearing eddy. The output of a single region of this kind is:

$$p'(\vec{r},t) = \frac{x_i x_j}{4\pi a_o^2 R^3} \, Ve \, [\ddot{T}_{ij}] \tag{312}$$

Since the outputs of the volume elements V_e are perfectly uncorrelated, their acoustic energy intensities, $\langle p'^2\rangle/\rho_o a_o$, must be added to give the radiation field.

Therefore, the sound intensity for each uncorrelated volume is:

$$I \sim \frac{V_e^{\,2} \, \overline{\ddot{T}^2}}{\rho_o \, a_o^5 \, R^2}$$

or,

$$I \sim \frac{V_e \, \omega^4 \overline{T}^2}{\rho_o \, a_o^5 \, R^2}$$

where,

$$\overline{\ddot{T}^2} = \omega^4 \, \overline{T}^2$$

The sound intensity including source convection, as discussed by Lighthill (References 44, 45 and 46), is written as:

$$I \sim \frac{Ve \, \omega^4 \, \overline{T}^2}{\rho_o \, a_o^5 \, R^2} \left[(1-M_c \cos\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2 \right]^{-5/2} \tag{313}$$

where M_c is the convection Mach number, M_c number, $M_c = u_o/a_o$

The convection factor $\left[(1 - M_c \cos\theta)^2 + \left(\frac{\omega \ell}{a_o}\right)^2\right]^{-5/2}$

replaces the original Lighthill form of $(1-M_c \cos\theta)^{-6}$. This convection term accounts for the neglect of variation in retarded time within an eddy, and allows Lighthills subsonic analysis to be extended for convective Mach numbers greater than one.

FAR-FIELD ACOUSTIC MODELS AVAILABLE IN NOISE

Lighthill Acoustic Computational Model

In order to compute the quantities included in equation 313, approximations are made (See References 1 and 187). The eddy volume was taken as ℓ^3, The quadrupole strength was assumed proportional to $\rho^2 u^4$; the quantity, $\omega\ell$, was approximately by 1.1u' (p.O. A.L. Davies frequency - eddy - shear assumption). With these assumptions, the mean square pressure fluctuation due to an individual ring volume element (See Figure 46) is:

$$\overline{p'^2} = \frac{\beta_L}{4\pi R^2} \cdot \frac{\rho^2 u' u^4}{\rho_o a_o^4 \ell} \cdot \left[(1-M_c \cos\theta)^2 + \left(\frac{1.1u'}{a_o}\right)^2\right]^{-5/2}$$

where β_L is a proportionality constant determined experimentally:

$$\beta_L = .478 \times 10^{-2} \quad \text{Hot Jets}$$

$$.956 \times 10^{-2} \quad \text{Cold Jets}$$

Empirical Self-Noise, Shear-Noise Model

The aeroacoustic relationship expressed by equation 313 describes what is commonly referred to as "self-noise" generation; i.e., noise generated directly by a turbulence-turbulence interaction. However, the directivity characteristics predicted by the self-noise model show some discrepancies with the experimental results. Reasons for this disagreement with experiment can be ascribed to refraction effects, quadrupole orientation, quadrupole source terms other than self-noise, or any combination thereof.

The term "shear noise" was probably first used by Lilley (Reference 187), and it reflects the idea that the acoustic source term can also be described in terms of a turbulence and mean "shear" interaction field. Related work concerning the mathematical descriptions of there terms can be found in the work of Ribner (References 11 and 34), Maestrello and McDaid (Reference 188) and Csanady (Reference 26). Jones (Reference 30) showed that, for subsonic jets, the "shear-noise" acoustic intensity directivity character should be of the form $I \sim (1 - M_c \cos\theta)^{-3}$, as opposed to the self-noise form of $I \sim (1 - M_c \cos\theta)^{-5}$.

With concepts such as this, a model was formulated for NOISE. Reference 1 and 10 document these concepts in more detail. The model was formulated as a composition of shear-noise and self-noise of the following form:

$$\overline{p'}^2 = \frac{\beta_L}{4\pi R} \cdot \frac{\rho^2 u'u'^4}{\rho_o\, a_o^4\, \ell} \left(X\, C_{x-x} + y\, C_{x-r} + Z\, C_1 \right) \tag{314}$$

where:

$$C_{x-x} = \mathrm{Cos}^4\,\theta \left[(1 - M_c \,\mathrm{Cos}\,\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2 \right]^{-3/2}$$

$$C_{x-r} = \mathrm{Sin}^2\,\theta\,\mathrm{Cos}^2\,\theta \left[(1 - M_c \,\mathrm{Cos}\,\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2 \right]^{-3/2}$$

$$C_1 = \left[(1 - M_c \,\mathrm{Cos}\,\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2 \right]^{-5/2}$$

The factors X, Y and Z are empirically determined factors based on subsonic jet noise data. Tables 7 and 8 show these factors: they are functions of Strouhal number based on the ambient speed of sound (fD/a_o), and of the jet angle θ; they are fixed separately for cold and hot jets and are independent of jet Mach number.

Ribners Self- and Shear-Noise Model

Ribner (Reference 3) also formulated a jet noise theory to calculate the relative contributions of self-noise and shear-noise cross coupling. He postulated isotropic turbulence superimposed on a mean shear flow and assumed a two-point velocity correlation separated in space and time. Ribner showed that the expression of sound intensity from a unit volume of jet is:

Table 7. Shear and Self Noise Table of Experimentally Determined Constants.

a) Cold Jets

fD/a_o	θ_{max}	X	Y_1	Y_2	Z_1	Z_2
0.01672	0	1	3.18	3.18	7.94	7.94
0.02105	0	1	2.95	2.95	7.38	7.38
0.02650	0	1	1.45	1.45	3.63	3.63
0.03368	0	1	1.49	1.49	3.72	3.72
0.04203	0	1	1.63	1.63	4.07	4.07
0.05293	0	1	0.60	0.60	1.51	1.51
0.06658	0	20	0.91	0.91	1.30	1.30
0.08360	0	20	0.37	0.37	0.53	0.53
0.10526	0	20	0.16	0.16	0.40	0.40
0.13287	20	20	0	0.29	5.57	0.977
0.16721	20	20	0	0.40	7.56	1.326
0.21051	20	20	0	0.65	12.4	2.175
0.26500	20	20	0	0.93	12.05	3.09
0.33368	30	20	0	1.03	13.4	3.43
0.42027	30	20	0	1.42	18.4	4.73
0.52926	40	40	0	1.44	15.8	4.79
0.66587	40	40	0	1.44	15.9	4.81
0.83607	40	40	0	3.21	35.3	10.7
1.05255	50	200	0	2.93	30.3	9.77
1.32875	50	200	0	2.63	27.2	8.76
1.67214	50	200	0	2.52	26.1	8.41
2.10511	50	200	0	2.92	30.1	9.72
2.65004	50	200	0	1.91	19.8	6.38
3.3318	50	200	0	1.91	19.8	6.38
11.7527	50	200	0	1.91	19.8	6.38
60.606	50	200	0	1.91	19.8	6.38

Note:

$$C_{xr} = \frac{\sin^2\theta \cos^2\theta}{\left[(1-M_c \cos\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2\right]^{3/2}}$$

$$C_{xx} = \frac{\cos^4\theta}{\left[(1-M_c \cos\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2\right]^{3/2}}$$

$$C_1 = \left[(1-M_c \cos\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2\right]^{-5/2}$$

$$C = Z\left(C_{xr} + \frac{1}{x} C_{xx}\right) + YC_1$$

where:

$$Y = \begin{cases} Y_1, & \theta < \theta_{max.} \\ Y_2, & \theta \geq \theta_{max.} \end{cases}$$

$$Z = \begin{cases} Z_1, & \theta < \theta_{max.} \\ Z_2, & \theta \geq \theta_{max.} \end{cases}$$

Table 7. Shear and Self Noise Table of Experimentally Determined Constants. (Concluded)

b) Hot Jets

fD/a_o	θ_{max}	X	Y_1	Y_2	Z_1	Z_2
0.02000	70	20	1.0	1.0	2.0	2.0
0.76268	70	20	1.0	1.0	2.0	2.0
0.96016	70	20	0.18	0.18	0.36	0.36
1.20872	70	20	0.53	0.53	1.05	1.05
1.52196	70	20	0	1.4	9.5	2.8
1.91692	70	20	0	1.65	11.2	3.3
1.91692	70	20	0	1.9	12.9	3.8
3.03711	70	20	0	1.5	10.2	3.0
3.81342	70	20	0	3.3	22.1	6.5
4.80042	70	20	0	2.1	14.3	4.2
6.06061	70	40	0	2.5	16.7	4.9
7.62683	70	40	0	1.4	9.35	2.75
9.60163	70	40	0	1.4	9.25	2.8
12.08716	70	40	0	0.57	5.4	1.86
15.21961	70	40	0	0.54	5.16	1.87
19.16922	70	40	0	0.468	4.5	1.56
24.14028	70	200	0	0.456	4.4	1.52
30.37113	70	200	0	0.446	5.28	1.82
38.13415	70	200	0	0.144	1.39	0.48
48.00817	70	200	0	0.75	7.25	2.5
60.60606	70	200	0	0.96	9.28	3.2
76.26830	70	200	0	1.2	11.6	4.0
96.01634	70	200	0	1.5	14.5	5.0
120.87164	70	200	0	1.89	18.3	6.3
152.19612	70	200	0	2.37	22.9	7.9

Table 8. **Fluid Shrouding for Unheated Jets.**

$M_j = 0.3$	θ_{jet} - Aft Quadrant								
fD/a_o	10	20	30	40	50	60	70	80	90
0.0500	8.45	7.64	6.43	5.06	3.79	2.71	1.77	0.88	-0.00
0.0630	8.44	7.63	6.42	5.06	3.79	2.71	1.77	0.88	-0.00
0.0800	8.42	7.61	6.41	5.06	3.79	2.71	1.77	0.88	-0.00
0.1000	8.39	7.59	6.40	5.05	3.78	2.71	1.77	0.88	-0.00
0.1250	8.35	7.57	6.39	5.04	3.78	2.70	1.77	0.88	-0.00
0.1600	8.28	7.52	6.36	5.02	3.77	2.70	1.76	0.88	-0.00
0.2000	8.19	7.46	6.32	5.00	3.75	2.69	1.76	0.87	-0.00
0.2500	8.05	7.38	6.27	4.97	3.73	2.68	1.75	0.87	-0.00
0.3150	7.84	7.25	6.20	4.93	3.71	2.66	1.74	0.87	-0.00
0.4000	7.54	7.06	6.08	4.86	3.66	2.63	1.73	0.16	-0.00
0.6000	7.13	6.81	5.94	4.78	3.61	2.59	1.70	0.86	0.00
0.6300	6.55	6.46	5.74	4.65	3.53	2.59	1.70	0.85	0.00
0.8000	5.72	5.97	5.45	4.48	3.41	2.46	1.61	0.80	0.00
1.0000	4.69	5.34	5.09	4.26	3.27	2.36	1.54	0.76	0.00
1.2500	3.35	4.52	4.62	3.98	3.08	2.23	1.44	0.70	0.00
1.6000	1.46	3.33	3.94	3.59	2.82	2.04	1.30	0.61	-0.00
2.0000	-0.66	1.91	3.12	3.15	2.54	1.85	1.15	0.52	0.00
2.5000	-3.22	0.08	2.08	2.66	2.23	1.64	1.01	0.46	-0.00
3.1500	-6.42	-2.36	0.71	2.16	1.94	1.44	0.93	0.48	-0.00
4.0000	-10.48	-5.59	-1.10	1.82	1.73	1.33	0.97	0.54	0.00
5.0000	-15.16	-9.44	-3.20	1.90	1.69	1.33	0.92	0.42	0.00
6.3000	-21.19	-14.45	-5.88	2.33	1.73	1.32	0.81	0.39	0.00
8.0000	-29.04	-21.00	-9.33	2.38	1.67	1.34	0.98	0.50	0.00
10.0000	-38.28	-28.68	-13.35	1.96	1.74	1.34	0.93	0.47	0.00

Note: The above is a table of ΔSPL's which should be applied to the 90° spectrum.

Table 8. Fluid Shrouding for Unheated Jets. (Continued)

$M_j = 0.3$	θ_{jet} - Forward Quadrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-0.85	-1.66	-2.44	-3.23	-4.06	-4.91	-5.70	-6.30
0.0630	-0.85	-1.66	-2.44	-3.23	-4.06	-4.91	-5.70	-6.29
0.0800	-0.85	-1.66	-2.44	-3.23	-4.05	-4.90	-5.69	-6.28
0.1000	-0.85	-1.65	-2.43	-3.22	-4.05	-4.89	-5.68	-6.26
0.1250	-0.85	-1.65	-2.43	-3.22	-4.04	-4.88	-5.66	-6.23
0.1600	-0.85	-1.65	-2.42	-3.21	-4.03	-4.86	-5.64	-6.19
0.2000	-0.84	-1.64	-2.42	-3.20	-4.01	-4.84	-5.60	-6.13
0.2500	-0.84	-1.64	-2.40	-3.18	-3.99	-4.80	-5.54	-6.04
0.3150	-0.84	-1.63	-2.38	-3.15	-3.95	-4.75	-5.46	-5.91
0.4000	-0.83	-1.61	-2.36	-3.11	-3.89	-4.66	-5.33	-5.70
0.5000	-0.82	-1.59	-3.32	-3.05	-3.81	-4.55	-5.15	-5.40
0.6300	-0.80	-1.55	-2.26	-2.97	-3.69	-4.38	-4.88	-4.95
0.8000	-0.77	-1.49	-2.17	-2.85	-3.52	-4.13	-4.50	-4.27
1.0000	-0.73	-1.41	-2.06	-2.69	-3.30	-3.83	-4.02	-3.36
1.2500	-0.66	-1.30	-1.91	-2.49	-3.03	-3.46	-3.47	-2.28
1.6000	-0.67	-1.14	-1.70	-2.21	-2.66	-3103	-3.00	-1.70
2.0000	-0.48	-0.98	-1.49	-1.95	-2.32	-2.66	-2.96	-2.85
2.5000	-0.44	-0.89	-1.33	-1.72	-2.01	-2.26	-2.90	-4.80
3.1500	-0.49	-0.91	-1.25	-1.55	-1.80	-1.93	-1.86	-3.75
4.0000	-0.50	-0.91	-1.23	-1.50	-1.75	-2.00	-2.20	-1.55
5.0000	-0.39	-0.79	-1.17	-1.52	-1.81	-2.02	-2.15	-3.87
6.3000	-0.41	-0.82	-1.21	-1.55	-1.83	-2.03	-2.36	-2.38
8.0000	-0.49	-0.95	-1.27	-1.55	-1.81	-2.07	-2.23	-1.13
10.0000	-0.41	-0.57	-0.90	-1.51	-1.82	-2.10	-0.81	-4.23

Table 8. Fluid Shrouding for Unheated Jets. (Continued)

$M_j = 0.5$	θ_{jet} - Aft Quadrant								
fD/a_o	10	20	30	40	50	60	70	80	90
0.0500	15.39	13.97	11.78	9.19	6.72	4.70	3.02	1.48	-0.00
0.0630	15.32	13.93	11.76	9.18	6.72	4.69	3.02	1.48	-0.00
0.8000	15.22	13.86	11.71	9.16	6.70	4.69	3.02	1.48	-0.00
0.1000	15.07	13.75	11.66	9.13	6.69	4.67	3.01	1.48	-0.00
0.1250	14.86	13.63	11.58	9.08	6.66	4.66	3.00	1.47	-0.00
0.1600	14.52	13.41	11.45	9.01	6.62	4.63	2.99	1.47	0.00
0.2000	14.08	13.13	11.29	8.92	6.57	4.60	2.97	1.46	0.00
0.2500	13.47	12.75	11.06	8.80	6.49	4.55	2.94	1.45	0.00
0.3150	12.62	12.21	10.75	8.63	6.39	4.49	2.90	1.43	0.00
0.4000	11.43	11.45	10.31	8.38	6.24	4.39	2.84	1.39	0.00
0.5000	10.01	10.52	9.76	8.07	6.05	4.26	2.75	1.34	0.00
0.6300	8.71	9.29	9.02	7.65	5.79	4.08	2.62	1.27	0.00
0.8000	5.88	7.67	8.01	7.09	5.44	3.84	2.44	1.15	0.00
1.0000	3.37	5.80	6.77	5.40	5.03	3.56	2.22	1.01	0.00
1.2500	0.47	3.51	5.18	5.54	4.54	3.23	1.97	0.87	0.00
1.6000	-3.29	0.37	2.87	4.34	3.94	2.84	1.72	0.77	0.00
2.0000	-7.38	-3.16	0.18	3.03	3.42	2.52	1.59	0.82	0.00
2.5000	-12.35	-7.56	-3.23	1.50	3.05	2.31	1.64	0.90	0.00
3.1500	-18.71	-13.25	-7.66	-0.29	2.94	2.27	1.56	0.67	0.00
4.0000	-26.99	-20.69	-13.44	-2.38	3.03	2.31	1.43	0.75	0.00
5.0000	-36.72	-29.42	-20.18	-4.62	3.08	2.31	1.58	0.75	0.00
6.3000	-49.36	-40.74	-28.89	-7.36	3.04	2.30	1.58	0.88	0.00
8.0000	-65.90	-55.52	-40.22	-10.84	3.06	2.30	1.39	0.76	0.00
10.0000	-85.36	-72.86	-53.50	-14.91	3.05	2.36	1.33	0.66	0.00

Table 8. Fluid Shrouding for Unheated Jets. (Continued)

$M_j = 0.5$	θ_{jet} - Forward Quadrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-1.40	-2.70	-3.93	-5.14	-6.35	-7.54	-8.63	-9.43
0.0630	-1.40	-2.70	-3.93	-5.13	-6.34	-7.53	-8.61	-9.40
0.0800	-1.40	-2.69	-3.92	-5.12	-6.32	-7.51	-8.58	-9.35
0.1000	-1.39	-2.69	-3.91	-5.10	-6.30	-7.48	-8.53	-9.29
0.1250	-1.39	-2.68	-3.89	-5.08	-6.27	-7.43	-8.47	-9.19
0.1600	-1.38	-2.67	-3.87	-5.04	-6.22	-7.36	-8.36	-9.03
0.2000	-1.38	-2.65	-3.83	-4.99	-6.15	-7.26	-8.22	-8.81
0.2500	-1.36	-2.62	-3.79	-4.92	-6.05	-7.12	-8.01	-8.47
0.3150	-1.34	-2.57	-3.71	-4.81	-5.90	-6.91	-7.69	-7.96
0.4000	-1.31	-2.50	-3.60	-4.65	-5.68	-6.60	-7.21	-7.14
0.5000	-1.25	-2.40	-3.45	-4.44	-5.38	-6.19	-6.59	-6.03
0.6300	-1.17	-2.24	-3.23	-4.14	-4.97	-5.64	-5.79	-4.63
0.8000	-1.04	-2.02	-2.92	-3.74	-4.44	-5.00	-5.10	-4.02
1.0000	-0.89	-1.75	-2.58	-3.30	-3.91	-4.46	-4.99	-5.50
1.2500	-0.76	-1.52	-2.26	-2.91	-3.42	-3.92	-4.87	-7.52
1.6000	-0.74	-1.45	-2.08	-2.61	-3.01	-3.18	-3.25	-4.57
2.0000	-0.84	-1.52	-2.03	-2.44	-2.82	-3.15	-3.09	-1.39
2.5000	-0.77	-1.39	-1.96	-2.43	-2.80	-3.10	-4.15	-5.90
3.1500	-0.62	-1.29	-1.88	-2.44	-2.94	-3.35	-3.51	-2.71
4.0000	-0.74	-1.42	-2.04	-2.50	-2.89	-3.17	-3.00	-4.35
5.0000	-0.75	-1.49	-1.95	-2.41	-2.89	-3.19	-3.14	-5.11
6.3000	-0.84	-1.32	-1.81	-2.48	-2.89	-3.25	-3.05	-3.11
8.0000	-0.67	-1.10	-1.86	-2.53	-2.90	-3.20	-4.20	-2.90
10.0000	-0.70	-1.23	-2.17	-2.44	-2.93	-2.96	-7.38	-5.99

Table 8. Fluid Shrouding for Unheated Jets. (Continued)

$M_j = 0.7$	θ_{jet} - Aft Quadrant								
fD/a_o	10	20	30	40	50	60	70	80	90
0.0500	23.56	21.51	18.20	14.12	10.08	6.85	4.33	2.10	-0.00
0.0630	23.33	12.35	18.11	14.07	10.06	6.84	4.32	2.09	-0.00
0.0800	22.98	21.13	17.98	14.01	10.03	6.82	4.31	2.09	-0.00
0.1000	22.52	20.83	17.80	13.92	9.98	6.79	4.30	2.08	-0.00
0.1250	21.88	20.41	17.56	13.79	9.92	6.75	4.28	2.08	-0.00
0.1600	20.90	19.77	17.19	13.60	9.82	6.69	4.24	2.06	-0.00
0.2000	19.73	18.99	16.73	13.36	9.69	6.62	4.20	2.04	0.00
0.2500	18.24	17.98	16.12	13.04	9.52	6.51	4.13	2.00	0.00
0.3150	16.35	16.65	15.31	12.61	9.28	6.35	4.03	1.95	0.00
0.4000	14.03	14.95	14.22	12.02	8.95	6.14	3.88	1.86	0.00
0.5000	11.54	13.05	12.93	11.30	8.55	5.87	3.68	1.74	0.00
0.6300	8.65	10.76	11.27	10.34	8.02	5.51	3.41	1.57	-0.00
0.8000	5.30	7.98	9.13	9.03	7.33	5.06	3.07	1.35	0.00
1.0000	1.74	4.91	6.64	7.44	6.57	4.59	2.73	1.16	0.00
1.2500	-2.44	1.19	3.55	5.41	5.73	4.10	2.43	1.10	-0.00
1.6000	-8.07	-3.91	-0.75	2.52	4.82	3.62	2.28	1.24	0.00
2.0000	-14.37	-9.70	-5.65	-0.78	4.21	3.32	2.33	1.19	0.00
2.5000	-22.20	-16.92	-11.74	-4.86	4.06	3.29	2.22	0.88	0.00
3.1500	-32.33	-26.28	-19.61	-10.09	4.56	3.34	2.10	1.21	0.00
4.0000	-45.57	-38.49	-29.83	-16.84	4.92	3.40	2.20	0.97	0.00
5.0000	-61.16	-52.83	-41.79	-24.69	4.56	3.39	2.14	0.97	0.00
6.3000	-81.42	-71.43	-57.27	-34.82	4.13	3.39	2.44	1.26	0.00
8.0000	-107.93	-95.71	-77.47	-48.01	4.70	3.36	2.33	1.12	0.00
10.0000	-139.12	-124.24	-101.18	-63.49	4.55	3.40	2.43	0.91	0.00

Table 8. Fluid Shrouding for Unheated Jets. (Continued)

$M_j = 0.7$	θ_{jet} - Forward Quadrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-1.94	-3.70	-5.32	-6.87	-8.36	-9.77	-11.00	-11.88
0.0630	-1.93	-3.69	-5.31	-6.85	-8.33	-9.74	-10.96	-11.81
0.8000	-1.93	-3.68	-5.29	-6.82	-8.30	-9.68	-10.88	-11.70
0.1000	-1.92	-3.66	-5.27	-6.78	-8.24	-9.61	-10.78	-11.55
0.1250	-1.91	-3.64	-5.23	-6.73	-8.17	-9.50	-10.62	-11.32
0.1600	-1.90	-3.61	-5.17	-6.64	-8.04	-9.33	-10.37	-10.93
0.2000	-1.87	-3.55	-5.08	-6.51	-7.87	-9.09	-10.02	-10.38
0.2500	-1.84	-3.48	-4.96	-6.33	-7.62	-8.74	-9.51	-9.56
0.3150	-1.78	-3.36	-4.77	-6.07	-7.25	-8.23	-8.75	-8.30
0.4000	-1.68	-3.17	-4.49	-5.68	-6.72	-7.51	-7.71	-6.54
0.5000	-1.54	-2.91	-4.13	-5.18	-6.07	-6.73	-6.81	-5.76
0.6300	-1.34	-2.55	-3.64	-4.57	-5.33	-6.01	-6.63	-7.34
0.8000	-1.12	-2.16	-3.13	-3.98	-4.66	-5.28	-6.53	-9.91
1.0000	-1.01	-1.99	-2.88	-3.65	-4.22	-4.50	-4.26	-3.76
1.2500	-1.10	-2.07	-2.81	-3.41	-3.89	-4.26	-4.59	-4.95
1.6000	-1.15	-2.05	-2.73	-3.26	-3.76	-4.32	-4.36	-5.26
2.0000	-0.89	-1.65	-2.46	-3.30	-3.92	-4.31	-4.21	-6.01
2.5000	-0.96	-2.00	-2.81	-3.40	-3.93	-4.32	-4.90	-7.68
3.1500	-1.08	-1.74	-2.53	-3.36	-3.89	-4.28	-4.86	-7.74
4.0000	-0.81	-1.90	-2.88	-3.41	-3.90	-4.35	-4.48	-3.63
5.0000	-1.10	-2.22	-2.84	-3.25	-3.87	-4.32	-4.24	-4.54
6.3000	-1.10	-2.24	-2.89	-3.28	-3.87	-4.31	-4.22	-6.44
8.0000	-0.87	-1.82	-2.85	-3.49	-3.88	-4.44	-4.17	-0.58
10.0000	-0.94	-0.60	-2.58	-3.98	-3.90	-4.81	-4.14	17.61

Table 8. Fluid Shrouding for Unheated Jets. (Continued)

$M_j = 0.9$	θ_{jet} - Aft Quadrant								
fD/a_o	10	20	30	40	50	60	70	80	90
0.0500	33.28	30.54	25.94	20.06	14.02	9.20	5.70	2.72	0.00
0.0630	32.65	30.12	25.70	19.96	13.97	9.18	5.69	2.72	-0.00
0.0800	31.75	29.53	25.35	19.78	13.90	9.14	5.66	2.71	-0.00
0.1000	30.62	28.77	24.90	19.56	13.80	9.09	5.64	2.70	0.00
0.1250	29.19	27.77	24.31	19.26	13.67	9.02	5.60	2.68	0.00
0.1600	27.21	26.36	23.43	18.83	13.46	8.90	5.53	2.65	0.00
0.2000	25.08	24.75	22.41	18.30	13.22	8.76	5.44	2.60	0.00
0.2500	22.65	22.87	21.15	17.63	12.89	8.56	5.31	2.53	0.00
0.3150	19.88	20.66	19.56	16.74	12.45	8.29	5.13	2.42	0.00
0.4000	16.76	18.10	17.62	15.56	11.86	7.92	4.86	2.25	0.00
0.5000	13.63	15.46	15.49	14.17	11.16	7.47	4.52	2.03	0.00
0.6300	10.07	12.37	12.91	12.35	10.24	6.91	4.11	1.76	0.00
0.8000	5.86	8.62	9.69	9.95	9.06	6.25	3.65	1.51	0.00
1.0000	1.22	4.39	6.00	7.13	7.74	5.62	3.26	1.43	-0.00
1.2500	-4.40	-0.81	1.45	3.63	6.21	5.05	2.99	1.59	0.00
1.6000	-12.13	-8.03	-4.89	-1.24	4.28	4.54	3.02	1.51	0.00
2.0000	-20.90	-16.24	-12.09	-6.72	2.32	4.38	3.00	1.17	0.00
2.5000	-31.82	-26.48	-21.02	-13.49	0.10	4.45	2.69	1.50	0.00
3.1500	-46.01	-39.76	-32.56	-22.20	-2.56	4.55	3.04	1.37	0.00
4.0000	-64.56	-57.10	-47.58	-33.48	-5.88	4.50	2.72	1.11	0.00
5.0000	-86.41	-77.45	-65.18	-46.67	-9.70	4.48	3.25	1.40	0.00
6.3000	-114.81	-103.86	-88.01	-63.76	-14.63	4.53	3.08	1.30	0.00
8.0000	-151.95	-138.37	-117.82	-86.04	-21.07	4.50	3.15	1.43	0.00
10.0000	-209.83	-178.94	-152.84	-112.20	-28.65	4.48	2.78	1.45	0.00

Table 8. Fluid Shrouding for Unheated Jets. (Concluded)

$M_j = 0.9$	θ_{jet} - Forward Quadrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-2.46	-4.64	-6.62	-8.44	-10.14	-11.68	-12.96	-13.82
0.0630	-2.45	-4.63	-6.60	-8.41	-10.09	-11.61	-12.87	-13.69
0.0800	-2.44	-4.61	-6.56	-8.35	-10.02	-11.51	-12.73	-13.48
0.1000	-2.43	-4.58	-6.51	-8.28	-9.91	-11.36	-12.52	-13.19
0.1250	-2.41	-4.54	-6.43	-8.17	-9.76	-11.15	-12.22	-12.74
0.1600	-2.37	-4.46	-6.31	-7.98	-9.50	-10.79	-11.71	-11.97
0.2000	-2.32	-4.35	-6.13	-7.73	-9.15	-10.32	-11.02	-10.90
0.2500	-2.24	-4.19	-5.88	-8.37	-8.66	-9.64	-10.04	-9.32
0.3150	-2.12	-3.94	-5.50	-5.84	-7.94	-8.70	-8.76	-7.41
0.4000	-1.91	-3.56	-4.95	-6.09	-7.00	-7.63	-7.78	-7.44
0.5000	-1.66	-3.08	-4.31	-5.32	-6.14	-6.95	-8.07	-10.09
0.6300	-1.39	-2.62	-3.75	-4.75	-5.52	-6.13	-7.37	-11.26
0.8000	-1.29	-2.51	-3.60	-4.47	-5.13	-5.35	-4.42	-0.50
1.0000	-1.44	-2.66	-3.54	-4.20	-4.65	-5.21	-6.81	-8.60
1.2500	-1.43	-2.51	-3.36	-4.01	-4.67	-5.39	-6.23	-7.00
1.6000	-1.08	-2.01	-3.12	-4.16	-4.90	-5.44	-5.33	-4.06
2.0000	-1.31	-2.70	-3.52	-4.20	-4.83	-5.19	-4.78	-6.02
2.5000	-1.32	-2.05	-3.05	-4.17	-4.84	-5.32	-5.49	-3.89
3.1500	-0.98	-2.29	-3.63	-4.30	-4.84	-5.41	-6.09	-8.33
4.0000	-1.22	-2.74	-3.70	-4.28	-4.78	-5.40	-6.14	-7.40
5.0000	-1.17	-2.61	-3.58	-4.31	-4.85	-5.38	-5.58	-6.95
6.3000	-1.26	-2.26	-2.97	-4.29	-4.84	-5.31	-4.48	-7.98
8.0000	-1.48	-2.01	-3.95	-4.08	-4.44	-5.13	-6.56	-12.12
10.0000	-0.37	-2.07	-7.66	-3.58	-3.45	-4.78	-9.56	-21.01

$$I = \frac{\overline{(p-p_o)}^2}{\rho_o a_o} \sim \frac{1}{R^2}\left(A + B\,\frac{\cos^4\theta + \cos^2\theta}{2}\right)\left[(1-M_c\cos\theta)^2 + \frac{\omega_f{}^2\ell^2}{\pi\, a_o{}^2}\right]^{-5/2} \tag{315}$$

Self Noise — Shear Noise — Convection factor

where:

$$A = \sqrt{2}\ \rho_o\omega_f{}^4\ u'^4\ell^3/4\pi^2 a_o{}^5$$

$$B = \rho_o\omega_f{}^4\ \ell^3\ U^2\ u'^2\ \sigma/8\ \pi^2\ a_o{}^5\ (1+\sigma)^{3/2}$$

$$\sigma = .45$$

If the characteristic radian frequency (ω_f) is approximated by the radian frequency (ω) of turbulence, and ω is approximated by $1.1\ u'/\ell$, the sound intensity can be written as:

$$I = \frac{\beta_R}{4\pi r^2}\ \frac{\rho^2 u'^6}{\rho_o a_o{}^5 \ell}\left[\sqrt{2}\ u'^2 + \frac{\lambda}{4} U^2\ (\cos^4\theta + \cos^2\theta)\right]\left[(1 - M_c\cos\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2\right]^{-5/2} \tag{316}$$

where:

$$\lambda = \sigma/(1+\sigma)^{3/2} = .258$$

$$\beta_R = \begin{cases} 0.4 & \text{Hot Jet} \\ 1.6 & \text{Cold Jet} \end{cases}$$

The additional directional effect ($\cos^4\theta + \cos^2\theta$), due to shear noise, is displayed.

Lilley Turbulent Mixing Model

Lilley (Reference 187) formulated a turbulent mixing model. His model is derived from the Lighthill theory. Lilley's work was divided into a contribution from self-noise in the turbulence, and the interaction between the turbulence and mean shear. The first part of the calculation relies on

Proudman's results, while the second part is developed from an approximation for $\partial p/\partial t$ covariance in incompressible sheat flow turbulence. The form of the acoustic intensity used in NOISE is:

$$I = \frac{\beta_L}{4\pi a_o^5} \frac{\rho^2 \left(\frac{\partial u}{\partial r}\right)^6 u'^2 \ell^5}{\rho_o \quad R^2} \sin^2\theta \cos^2\theta \left[(1-M_c \cos\theta)^2 + \left(\frac{(\omega\ell)}{a_o}\right)^2\right]^{-5/2} \quad (317)$$

where β_L is as given earlier.

Pao Turbulent Mixing Shear Layer Model

The Pao model (References 2 and 189) is based on the convected wave equation introduced by Phillips in 1960. The convected wave equation itself is derived through the basic principles of fluid mechanics, and it is a natural extension of the Lighthill equation of aerodynamic noise. The linearized version of the general equation has the form of a simple wave equation in Lagrangian coordinates. The right-hand side of this equation contains four terms: a turbulent quadrupole, shear flow and turbulence interaction, entropy fluctuations, and viscous effects. If the flow field is free of shocks, the acoustic pressure fluctuation can be assumed to be decoupled from the entropy fluctuations. It is tacitly assumed in the analysis that all terms on the right-hand side of the wave equation are known quantities and the contributions of individual terms can be considered as independent of each other, as with all the models presented.

The Pao acoustic intensity (per unit volume) expressions contained in NOISE are as follows:

$$I = \begin{cases} \dfrac{p_o^{\;2}}{\rho_o a_o} \cdot \dfrac{3\sqrt{2}\,\pi^{3/2}\, v_o^{\;4}\, M^8\, \alpha^4}{R^2\, A^2\, \ell} \cdot \dfrac{q_\infty}{q_o}\left(\dfrac{\hat{M}_c}{M}\right)^4 E\mu \, \dfrac{A}{(1-M_c \operatorname{Cos}\theta)}\left(A^2+\alpha^2\, \hat{M}_c^2\right)^{-5/2}, & \text{SO} \\[2ex] \dfrac{p_o^{\;2}}{\rho_o a_o} \cdot \dfrac{160\sqrt{2}\pi^2 v_o^4 M^8 A_i^2(0)\alpha^{13/3}}{9R^2\, A^2\, \ell^{4/3}\, \Omega^{1/3}} \tan\theta\, \Gamma\!\left(\dfrac{2}{3}\right) (\cos\theta)^{13/3}\, E\mu \\ \quad \cdot\left(\dfrac{\hat{M}_c}{M}\right)^{13/3} \left[(1-M_c \operatorname{Cos}\theta)^2 + \alpha^2\, \hat{M}_c^{\;2} \operatorname{Cos}^2\theta\right]^{-8/3}, & \text{S1a} \\[2ex] \dfrac{p_o^{\;2}}{\rho_o a_o} \cdot \dfrac{3\sqrt{2}\,\pi^{3/2}\, v_o^{\;4}\, M^8\, \alpha^4}{R^2\, A^2 \ell}\left(\dfrac{q_\infty}{q_o}\right)\left(\dfrac{\hat{M}_c}{M}\right)^4 \dfrac{F(b)}{F(0)} \cos^4\theta E\mu \\ \quad \cdot\left[(1-M_c \operatorname{Cos}\theta)^2 + \alpha^2\, \hat{M}_c^{\;2} \operatorname{Cos}^2\theta\right]^{-5/2}, & \text{S1b} \end{cases} \quad (318)$$

where:

$$\sigma_o = u'/u_j$$

$$M = u_j/a_o$$

$$M_c = u/a_o$$

$$A = a/a_o$$

$$\alpha = \begin{cases} .3, & \text{cold jet} \\ .5, & \text{hot jet} \end{cases}$$

$$\frac{\hat{M}_c}{M} = .6 \; \frac{u_{\mathfrak{c}}}{u_j}$$

$$E_1 = 1, \text{ self noise}$$

$$E_2 = \ell^2 \; \frac{(\mathrm{Cos}^4 \; \theta_o + \mathrm{Cos}^2 \; \theta_o)}{2\sqrt{2} \; \sigma_o^2 \; M^2} \left(\frac{\partial u}{\partial r}\right)^2$$

$$\Omega = \frac{1}{M} \frac{d}{dy} \left(\frac{M_c}{A}\right)$$

$$b = \frac{2\sqrt{2} \; \hat{M}_c \; W \; (y_o, \; \theta) \; \alpha \; \mathrm{Cos} \; \theta}{\ell \; \sqrt{\mu} \; [(1-M_c \; \mathrm{Cos} \; \theta)^2 + \alpha^2 \; M_c^2 \; \mathrm{Cos}^2 \; \theta]^{1/2}}$$

$$\mu = \begin{cases} 1, & \text{self noise} \\ 2, & \text{shear noise} \end{cases}$$

$$\frac{q_\infty}{q_o} = \left| \frac{A^2 \ (1-\text{Cos}^2 \ \theta)}{(1-M_c \ \text{Cos} \ \theta)^2 - A^2 \ \text{Cos}^2 \ \theta} \right|$$

$$A_i \ (0) = 0.35503$$

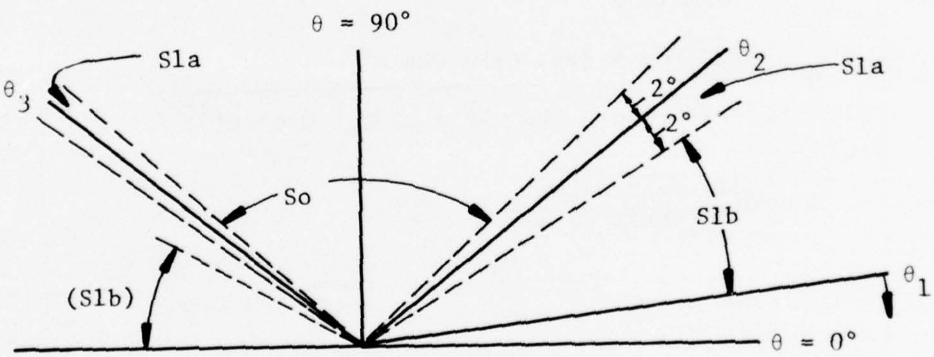
$$F(b) = \int_b^\infty e^{b^2-u^2} \ (u-b)^4 \ du$$

$$\text{Cos} \ \theta_o = \frac{A \ \text{Cos} \ \theta}{1-M_c \ \text{Cos} \ \theta}, \ \cos \ \theta_o = 1 \text{ when } \theta \leq \theta_2$$

$$W(y_o, \ \theta) = \int_{t_p}^{y_o} M\left(\frac{q}{K_1}\right) dy = Q/k_1$$

$$\frac{q^2}{K_1^2} = \left[\frac{\frac{1}{\cos \ \theta} + M_c \ (y)}{A \ (y) \ M}\right]^2 - \frac{1}{M^2}$$

The choice of solutions is obtained through a selection process defined below:



where,

$$\text{Cos}\theta_1 = \frac{1}{M_c-A} \ ; \ \theta_1 < \pi/2; \quad \theta_1 = 0 \text{ if } M_c - A \leq 1$$

$$\text{Cos}\theta_2 = \frac{1}{M_c+A}$$

$$\text{Cos} \ \theta_3 = \frac{1}{M_c-A} \ ; \ \frac{\pi}{2} < \theta_3 < \pi \text{ if } M_c - A \geq -1$$

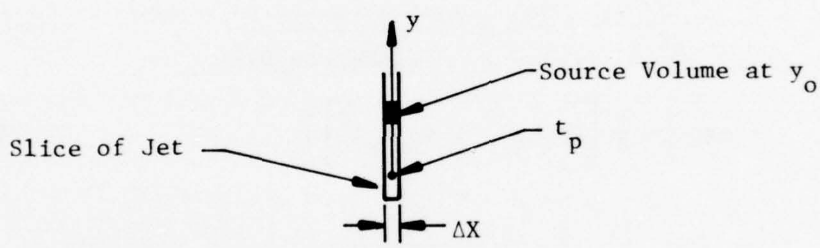
The quantities t_p, Q, and W(yo, θ) are determined as follows:

t_p <u>Computation</u>:

For a given source volume and far-field angle θ, determine t_p from the equation (y = tp):

$$\text{Cos } \theta = \frac{1}{M_c(y) + A(y)} \quad (\theta < \theta_2)$$

This means that, at a given angle θ, (θ < θ_2), there is a unique y = t_p at a given axial location X. See sketch below:



<u>Q Calculation</u>:

$$Q = \int_{t_p}^{y_o} Mq \, dy, \quad \text{note } W(yo,\theta) = Q/K_1$$

where Mq is given by:

$$\frac{q^2}{k_1^2} = \left[\frac{\frac{1}{\cos\theta} + M_c\ (y)}{A(y)\ M}\right] - \frac{1}{M^2}$$

$$k_1 = -\ M\omega \text{ Cos } \theta$$

<u>Spectrum Calculations</u>:

There exist two options for computing the spectrum. One is the way described for all the previously discussed turbulent mixing models; the second method is via Pao's spectrum calculation. The latter is performed as follows:

$$\text{(S0)} \quad \frac{\overline{p'^2}}{p_o^2}(y,\omega) = \frac{\pi^2 v_o^4 M^8 \hat{L}_t}{32 R^2 A^6 \ell} \left(\frac{q_\infty}{q_o}\right) \frac{(\omega_o \hat{L}_1)^4}{(1-M_c \cos\theta)}$$

$$\cdot \exp\left\{-\frac{1}{8}\left[(k_o\hat{L}_1)^2 + (\omega_o\hat{L}_t)^2\right]\right\} \tag{319}$$

$$\text{(S1a)} \quad \frac{\overline{p'^2}}{p_o^2}(y,\omega) = \frac{\pi^2 v_o^4 M^8 \hat{L}_t A_i^2(0) \tan\theta}{8R^2 A^2 \ell^{4/3} \Omega^{1/3}} \frac{(\omega_o \hat{L}_1 \cos\theta)^{13/3}}{(1-M_c \cos\theta)^{16/3}}$$

$$\cdot \exp\left\{-\frac{1}{8}\left[(k_1\hat{L}_1)^2 + (\omega_o\hat{L}_t)^2\right]\right\} \tag{320}$$

$$\text{(S1b)} \quad \frac{\overline{p'^2}(y,\omega)}{p_o^2} = \frac{\pi v_o^4 M^8 \hat{L}_t}{32 r^2 A^2 \ell} \left(\frac{q_\infty}{q_o}\right) e^{-2Q} \frac{(\omega_o \hat{L}_1 \cos\theta)^4}{(1-M_c \cos\theta)^5}$$

$$\cdot \exp\left\{-\frac{1}{8}\left[(k_1\hat{L}_1)^2 + (\omega_o\hat{L}_t)^2\right]\right\} \tag{321}$$

where:

$\hat{L}_t = \frac{\ell}{u_j} \alpha \frac{U}{B}$

β = width of mixing zone

$\omega = 2\pi$ St

$\omega_o = 2\pi$ St $(1-M_c \cos\theta)$, Source Frequency

$\hat{L}_1 = \ell/B$

$k_1 = -M\omega \cos\theta$

$k_o = -\omega_o M/A$

$$\text{St} = \frac{1}{4\pi a^2}\begin{cases} -\hat{b} + \sqrt{\hat{b}^2 + 8a^2}, & \text{Self Noise} \\ -\hat{b} + \sqrt{\hat{b}^2 + 4a^2}, & \text{Shear Noise} \end{cases}$$

$$\hat{b} = M\,W\,(y_o,\ \theta)\ \mathrm{Cos}\theta$$

$$a^2 = \frac{1}{8}\left[(1-M_c\ \mathrm{Cos}\theta)^2 + \alpha^2 M_c^{\,2}\ \mathrm{Cos}^2\theta\right]\ \frac{\ell}{u_j\alpha}^{\;2}$$

METHODS OF ACOUSTIC CALCULATION IN NOISE

Sound Pressure Calculation

The mean square pressure fluctuation due to an annular ring volume element of jet $\Delta V = 2\pi r\Delta x$, as shown in Figure 46 of the text, can be written as:

$$\bar{p}'^2\Delta V = \frac{\beta_L}{4\pi R^2}\ \frac{\rho^2 u'^4 u^4}{\rho_o a_o^4 \ell}\left[(1-M_c\ \mathrm{Cos}\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2\right]^{-5/2} 2\pi r\Delta r\Delta x \qquad (322)$$

for the basic Lighthill model (similar type expressions are used for the other acoustic models discussed earlier).

The radian frequency at which each volume element emits energy is approximated by:

$$\omega = 1.1\ u'/\ell$$

where the turbulence velocity u' and the turbulent length scale (ℓ) are determined for each local volume from the JETMIX and SSFD programs described in Appendices 6 and 7. The frequency, ω, is the frequency in the eddy frame of reference. The frequency at the observation point, ω_s, is related to it through a Doppler shift:

$$\omega = \left[(1-M_c\ \mathrm{Cos}\theta)^2 + \left(\frac{\omega\ell}{a_o}\right)^2\right]^{1/2} \omega_s \qquad (323)$$

The best correlation with data was found, however, by assuming:

$$\omega = 1/2\ \omega_s$$

This amounts to assuming that frequencies in the moving frame of reference at u_c are half of those received by the stationary observer.

For the whole jet then, the mean square sound pressures from all circular ring regions combine to give the overall mean square sound pressure. The 1/3 octave (or 1 octave) band analysis sums the mean square pressures whose frequencies fall into the range of a frequency band. This gives the sound pressure level for the frequency band. Thus, the sound pressure level frequency spectrum of the jet is constructed by calculating the sound pressure levels in the various frequency bands.

Acoustic Power of the Jet

To obtain the acoustic power output from the circular ring of jet we may write:

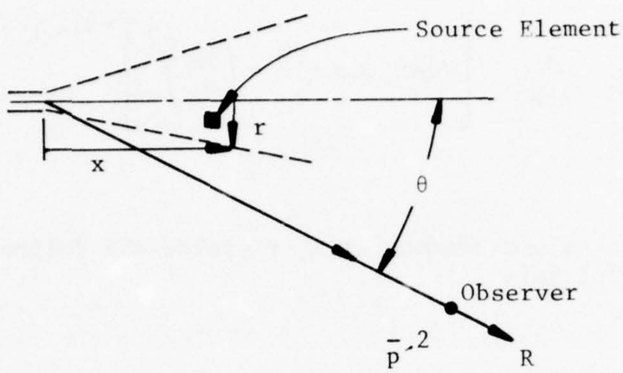
$$\Pi = \int_o^{2\pi} \int_o^{\pi} I_r\ R\ \mathrm{Sin}\theta dQ R d\theta \qquad (324)$$

$$= 2\pi R^2 \int_o^{\pi} I_r\ \mathrm{Sin}\theta d\theta$$

or, for an incremental volume:

$$\pi_1(x, r_j\omega) = 2\pi R^2 \int_o^{\pi} \frac{\bar{p}'^2}{\rho_o a_o}\ \mathrm{Sin}\theta d\theta \qquad (325)$$

The geometry is defined by the sketch below:



The sound power of the jet for one jet element is obtained by integration of the sound intensity over a large spherical surface enclosing the jet.

Integrating across the jet results in:

$$\pi_2(x,\omega) = \int_0^{r_j} \pi_1(x,r_j\omega)\ dr \tag{326}$$

This represents a power spectrum generated by a slice of jet at an axial station X.

Integrating with respect to frequency gives:

$$\pi_3(x) = \int_0^{\infty} \pi_2(x,\omega)\ d\omega \tag{327}$$

which represents the total acoustic power output from a slice of jet at X.

For the entire jet:

$$\pi_T = \int_0^{\infty} \pi_3\ (x)\ dx \tag{328}$$

All of these quantities are available in the NOISE program. To illustrate some of the explicit formulations, again consider the Lighthill acoustic model:

$$\frac{\overline{p'^2}}{\rho_o a_o} = \frac{V_e \omega^4 \overline{T}^2}{\rho_o a_o^5} \frac{1}{4\pi R^2} \left[(1-M_c \cos\theta)^2 + \left(\frac{\omega \ell}{a_o}\right)^2 \right]^{-5/2} \tag{329}$$

Then, integration of a volume element at x, r yields the following acoustic power per unit volume of jet:

$$\pi_1(x, r_j \omega) = \frac{V_e \omega_i^4 \overline{T}_i^2}{2\rho_o a_o^5} \int_o^\pi \frac{\sin\theta \; d\theta}{\left[(1-M_c \cos\theta)^2 + \left(\frac{\omega \ell}{a_o}\right)^2 \right]^{5/2}} d\theta \cdot 2\pi \Delta r_i \Delta x r_i \tag{330}$$

Integration yields:

$$\pi_1(x, r, \omega) = \frac{V_e \omega_i^2 \overline{T}_i^2}{2\rho_o a_o^5} \cdot \frac{1}{3M_c q^2} \left\{ \frac{M_c - 1}{\left[(1-M_c)^2 + q^2\right]^{1/2}} \left[\frac{1}{(1-M_c)^2 + q^2} + \frac{2}{q^2} \right] \right.$$

$$\left. + \frac{M_c + 1}{\left[(1+M_c)^2 + q^2\right]^{1/2}} \left[\frac{1}{(1+M_c)^2 + q^2} + \frac{2}{q^2} \right] \right\} 2\pi r_i \Delta r_i \Delta x_i \tag{331}$$

where:

$$q^2 \equiv \left(\frac{\omega \ell}{a_o}\right)^2$$

Thus, through simple summation, it is possible to calculate the power spectrum (π_2) generated by a slice of jet at x, the acoustic power (π_3) radiated from the slice of jet at x, and the total power (π_T).

Mani Slug Flow Analysis

Mani's model (see Section 1 of Volume II of this final report) represents the sound field produced by a convected-point quadrupole embedded in, and moving along the axis of, a round plug jet. The essential feature of this model is the incorporation of mean flow shrouding effects on the radiation of the convective quadrupoles.

The starting point of Mani's analysis is the Lilley equation:

$$\frac{\bar{D}^3 r'}{\bar{D}t^3} + 2\,\frac{dV_1}{dx_2}\,\frac{\partial}{\partial x_1}\left(a^{-2}\,\frac{\partial r'}{\partial x_2}\right) - \frac{\bar{D}}{Dt}\,\frac{\partial}{\partial x_i}\left(a^{-2}\,\frac{\partial r'}{\partial x_i}\right)$$

$$= -2\gamma\,\frac{dV_1}{dx_2}\,\frac{\partial^2}{\partial x_i \partial x_k}\left(u'_2 u'_k\right) + \gamma\,\frac{D}{Dt}\,\frac{\partial^2 (u'_i u'_j)}{\partial x_i \partial x_j} \cdot \cdot \cdot \cdot$$

Mani's work deals with the second term on the right-hand side of the above equation (the self-noise term). The details of the solution are not given here, since they are completly described in Section 1, Chapter I, Volume II of this final report. Suffice to say that there exists two fundamental solutions; one basic solution for unheated jets, and a second solution for heated jets.

Each solution is composed of an acoustic intensity expression consisting of quadrupole solutions which include the influence of fluid shrouding. The composite quadrupole solutions are formulated from six basic quadrupoles (x-x, x-y, x-z, y-z, y-y, and z-z), weighted according to Ribner's 1970 studies. The basic difference between this model and Ribner's work is that the weak cross quadrupole contributions (i.e., of type xx-yy, xx-zz, yy-zz, etc.) are neglected.

For both the unheated jet and the heated jet, the acoustic intensity is evaluated from the following formula:

> $I \sim$ (mean square pressure of x-x quadrupoles) + 4 (circumferential average of mean square pressure of x-y or x-z quadrupoles) + 2 (circumferential average of mean square pressure of y-y or z-z quadrupoles) + 2 (circumferential average of y-z quadrupole).

The far-field acoustic pressure expressions are given by equations 43-51 of Section 1.0 of Volume II, for the unheated jet. For the heated jet solution, representative average estimates of $\partial\rho/\partial r$, $\partial^2\rho/\partial r^2$, etc. are incorporated whenever a quadrupole singularity for the heated jet generates additional dipole and source-like terms. For the heated jet, then, the

interference between different order multipole singularities is neglected (see equations 55 - 59 of Section 1.0 of Volume II of this final report).

A recommended procedure for predictive purposes would be to use the Ribner turbulent mixing model available in NOISE, modified for the inclusion of fluid shielding by Mani's model. To perform the corrections for fluid shrouding, use Tables 9 and 10 given here.

NEAR-FIELD ACOUSTIC MODEL AVAILABLE IN NOISE

The near sound field of a jet can be considered as a region within 20 to 30 diameters from the jet exhaust nozzle. More precise definitions are the induction near field at distances less than a wavelength from the source and the geometric near field at distances from the sources that are less than the order of the geometric extent of the source. In many situations, both induction and geometric near fields overlap each other and, for practical purposes, a region within 20 to 30 diameters from the jet exhaust includes both types of near field.

The near and far sound field of a jet display quite different properties. For example, the familiar far-field sound pressure dependence on the inverse of distance and the simple relationship between the sound pressure and intensity $I = \overline{(p - p_o)^2}/\rho_o a_o$ are no longer valid for the near field. In the far field, the distances from the observation point to different parts of the source distribution in the jet flow field are approximately equal. In the near field, the spatial distribution of sources along the jet flow becomes very important because distances are different from different parts of the jet flow to the observer.

Table 9. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.25$.

$M_j = 0.7$ fD/a_o	θ_{jet} - Aft Quadrant								
	10	20	30	40	50	60	70	80	90
0.0500	22.84	21.05	17.78	13.15	7.38	1.26	-3.21	-5.60	-7.54
0.0630	22.10	20.53	17.44	12.95	7.28	1.22	-3.23	-5.62	-7.55
0.0800	21.11	19.80	16.93	12.64	7.12	1.15	-3.27	-5.64	-7.57
0.1000	19.82	18.83	16.27	12.24	6.91	1.06	-3.31	-5.67	-7.59
0.1250	18.19	17.58	15.39	11.70	6.63	0.93	-3.37	-5.69	-7.63
0.1600	16.00	15.85	14.13	10.91	6.25	0.77	-3.46	-5.76	-7.70
0.2000	13.67	13.92	12.66	9.99	5.78	0.54	-3.61	-5.89	-7.79
0.2500	11.09	11.75	10.96	8.83	5.13	0.21	-3.85	-6.10	-7.98
0.3150	8.22	9.31	8.98	7.39	4.27	-0.23	-4.18	-6.40	-8.25
0.4000	5.07	6.60	6.71	5.64	3.17	-0.80	-4.61	-6.80	-8.59
0.5000	1.94	3.88	4.37	3.76	1.96	-1.43	-5.12	-7.34	-9.16
0.6300	-1.48	0.89	1.73	1.57	0.44	-2.30	-5.88	-8.17	-10.00
0.8000	-5.29	-2.51	-1.32	-1.04	-1.52	-3.42	-6.84	-9.21	-11.09
1.0000	-9.30	-6.16	-4.64	-3.94	-3.79	-4.70	-7.84	-10.30	-12.24
1.2500	-14.09	-10.62	-8.68	-7.42	-6.52	-6.21	-8.83	-11.19	-12.76
1.6000	-20.45	-16.61	-14.18	-12.03	-9.96	-8.01	-9.76	-11.98	-13.38
2.0000	-27.00	-22.70	-19.65	-16.91	-13.98	-10.12	-10.44	-12.61	-13.98
2.5000	-35.40	-30.93	-27.41	-23.75	-19.31	-12.75	-10.97	-13.18	-14.73
3.1500	-47.55	-42.59	-38.10	-32.89	-26.22	-16.02	-11.36	-13.68	-15.48
4.0000	-63.79	-58.00	-51.99	-44.57	-34.91	-20.01	-11.60	-14.09	-16.23
5.0000	-82.45	-75.59	-67.69	-57.61	-44.45	-24.29	-11.80	-13.86	-13.19
6.3000	-105.39	-97.09	-86.74	-73.50	-56.52	-29.90	-12.17	-12.72	-11.72
8.0000	-134.59	-124.97	-112.21	-95.14	-72.57	-37.15	-12.06	-12.13	-12.01
10.0000	-170.42	-158.29	-142.32	-120.74	-91.69	-45.67	-11.99	-13.21	-13.10

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Table 9. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.25$ (Continued).

$M_j = 0.7$	θ_{jet} - Forward Quadrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-9.45	-11.06	-12.19	-12.94	-13.47	-13.86	-14.14	-14.31
0.0630	-9.46	-11.07	-12.21	-12.95	-13.49	-13.87	-14.13	-14.28
0.0800	-9.48	-11.10	-12.23	-12.98	-13.51	-13.88	-14.12	-14.25
0.1000	-9.49	-11.11	-12.26	-13.00	-13.55	-13.90	-14.10	-14.17
0.1250	-9.51	-11.15	-12.30	-13.06	-13.61	-13.93	-14.05	-14.03
0.1600	-9.59	-11.24	-12.39	-13.15	-13.72	-13.98	-13.98	-13.79
0.2000	-9.71	-11.35	-12.50	-13.27	-13.85	-14.04	-13.90	-13.49
0.2500	-9.87	-11.49	-12.64	-13.41	-14.01	-14.11	-13.80	-13.12
0.3150	-10.09	-11.68	-12.82	-13.60	-14.23	-14.22	-13.66	-12.57
0.4000	-10.41	-11.96	-13.08	-13.87	-14.54	-14.37	-13.46	-11.64
0.5000	-10.90	-12.34	-13.42	-14.21	-14.93	-14.57	-13.29	-10.89
0.6300	-11.58	-12.86	-13.86	-14.66	-15.44	-14.82	-13.15	-10.70
0.8000	-12.47	-13.51	-14.42	-15.28	-16.20	-15.20	-13.51	-12.69
1.0000	-13.29	-14.22	-15.14	-16.06	-17.09	-15.59	-14.09	-14.95
1.2500	-13.97	-14.86	-15.75	-16.68	-17.94	-15.92	-14.62	-16.68
1.6000	-14.62	-15.42	-16.26	-17.17	-18.84	-16.19	-15.18	-18.03
2.0000	-15.13	-15.80	-16.57	-17.41	-19.60	-16.36	-15.62	-18.54
2.5000	-15.58	-16.04	-16.75	-17.48	-20.30	-16.44	-15.97	-18.32
3.1500	-15.93	-16.16	-16.78	-17.39	-20.77	-16.34	-15.53	-13.51
4.0000	-15.85	-16.11	-16.77	-17.40	-19.45	-16.19	-14.98	-11.46
5.0000	-14.70	-16.04	-16.76	-17.38	-16.89	-16.33	-15.12	-15.44
6.3000	-13.88	-16.09	-16.77	-17.39	-15.46	-16.45	-14.64	-17.76
8.0000	-14.36	-16.20	-16.80	-17.49	-17.82	-16.33	-12.75	-14.75
10.0000	-16.82	-16.37	-16.86	-17.64	-22.61	-16.10	-10.04	-8.83

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Table 9. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.25$ (Continued).

$M_j = 0.9$	θ_{jet} - Aft Quadrant								
fD/a_o	10	20	30	40	50	60	70	80	90
0.0500	30.97	28.91	24.86	19.09	11.88	4.06	-1.86	-5.03	-7.55
0.0630	29.42	27.74	24.07	18.65	11.68	3.98	-1.90	-5.05	-7.57
0.0800	27.48	26.25	23.08	18.05	11.38	3.86	-1.96	-5.08	-7.59
0.1000	25.35	24.55	21.81	17.27	10.99	3.70	-2.03	-5.13	-7.63
0.1250	22.88	22.49	20.25	16.26	10.48	3.49	-2.14	-5.17	-7.70
0.1600	19.89	19.92	18.20	14.87	9.74	3.22	-2.27	-5.28	-7.82
0.2000	16.99	17.36	16.09	13.36	8.94	2.86	-2.50	-5.50	-7.96
0.2500	14.02	14.80	13.89	11.62	7.90	2.37	-2.85	-5.83	-8.27
0.3150	10.90	12.01	11.40	9.59	6.56	1.70	-3.33	-6.30	-8.70
0.4000	7.37	8.85	8.58	7.26	4.91	0.83	-3.97	-6.91	-9.25
0.5000	3.78	5.64	5.74	4.86	3.11	-0.13	-4.70	-7.69	-10.07
0.6300	-0.24	2.04	2.56	2.14	0.99	-1.35	-5.68	-8.78	-11.17
0.8000	-4.74	-2.00	-0.99	-1.08	-1.69	-2.97	-6.81	-9.95	-12.39
1.0000	-9.46	-6.47	-5.24	-4.79	-4.72	-4.81	-7.87	-10.95	-13.45
1.2500	-15.44	-12.11	-10.46	-9.41	-8.41	-7.00	-8.81	-11.50	-13.30
1.6000	-23.78	-20.07	-17.76	-15.69	-13.41	-9.73	-9.78	-11.82	-13.12
2.0000	-33.12	-28.98	-26.00	-22.21	-18.27	-12.85	-10.47	-12.08	-12.94
2.5000	-44.14	-39.05	-34.85	-30.52	-25.20	-16.92	-10.98	-12.30	-12.71
3.1500	-58.04	-52.97	-48.20	-42.41	-34.57	-22.14	-11.34	-12.53	-12.56
4.0000	-78.76	-72.99	-66.63	-58.20	-46.61	-28.66	-11.50	-12.75	-12.50
5.0000	-103.91	-96.85	-88.12	-76.28	-60.11	-35.78	-11.47	-13.23	-16.19
6.3000	-136.04	-127.01	-114.93	-98.44	-76.40	-44.76	-11.03	-13.67	-16.11
8.0000	-175.89	-164.10	-147.50	-126.58	-98.55	-56.66	-11.05	-13.60	-11.86
10.0000	-220.84	-207.33	-187.57	-161.04	-124.61	-70.80	-11.26	-13.56	-11.80

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Table 9. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.25$ (Concluded).

$M_j = 0.9$	θ_{jet} - Forward Quadrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-9.97	-12.02	-13.60	-14.82	-15.83	-16.69	-17.34	-17.74
0.0630	-9.99	-12.04	-13.62	-14.84	-15.85	-16.71	-17.34	-17.72
0.0800	-10.01	-12.07	-13.65	-14.87	-15.87	-16.73	-17.35	-17.71
0.1000	-10.03	-12.10	-13.68	-14.90	-15.91	-16.78	-17.36	-17.66
0.1250	-10.07	-12.16	-13.75	-14.97	-15.98	-16.85	-17.38	-17.58
0.1600	-10.19	-12.27	-13.86	-15.07	-16.08	-16.97	-17.40	-17.45
0.2000	-10.37	-12.42	-13.99	-15.20	-16.21	-17.10	-17.44	-17.30
0.2500	-10.62	-12.62	-14.16	-15.35	-16.36	-17.27	-17.47	-17.11
0.3150	-10.95	-12.87	-14.38	-15.56	-16.57	-17.50	-17.54	-16.81
0.4000	-11.43	-13.25	-14.69	-15.86	-16.87	-17.83	-17.62	-16.37
0.5000	-12.10	-13.73	-15.08	-16.21	-17.23	-18.23	-17.73	-15.88
0.6300	-12.93	-14.31	-15.56	-16.67	-17.69	-18.76	-17.87	-15.36
0.8000	-13.86	-14.97	-16.13	-17.24	-18.37	-19.58	-18.11	-16.17
1.0000	-14.39	-15.56	-16.72	-17.75	-18.91	-20.35	-18.30	-16.93
1.2500	-14.60	-16.05	-17.17	-18.13	-19.24	-21.09	-18.43	-17.66
1.6000	-14.76	-16.44	-17.48	-18.37	-19.30	-21.86	-18.52	-18.39
2.0000	-14.85	-16.65	-17.60	-18.43	-19.12	-22.49	-18.54	-18.97
2.5000	-14.90	-16.73	-17.57	-18.36	-18.73	-23.05	-18.51	-19.47
3.1500	-14.94	-16.66	-17.41	-18.24	-18.83	-23.00	-18.32	-19.08
4.0000	-15.46	-16.27	-17.47	-18.28	-18.82	-20.84	-18.41	-19.04
5.0000	-16.10	-16.28	-17.45	-18.27	-18.48	-18.19	-18.56	-19.06
6.3000	-15.62	-16.57	-17.42	-18.26	-18.77	-16.51	-18.51	-18.74
8.0000	-15.06	-16.73	-17.48	-18.25	-20.25	-16.16	-18.27	-18.14
10.0000	-15.18	-16.72	-17.61	-18.23	-22.45	-16.82	-17.89	-17.36

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Table 10. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.5$.

$M_j = 0.7$	θ_{jet} – Aft Quadrant								
fD/a_o	10	20	30	40	50	60	70	80	90
0.0500	23.41	21.43	18.04	13.50	8.40	3.90	0.88	-1.37	-3.42
0.0630	22.99	21.15	17.87	13.41	8.36	3.86	0.86	-1.37	-3.43
0.0800	22.41	20.74	17.60	13.26	8.29	3.81	0.84	-1.39	-3.44
0.1000	21.62	20.19	17.25	13.06	8.19	3.73	0.81	-1.41	-3.45
0.1250	20.55	19.44	16.77	12.80	8.06	3.63	0.77	-1.42	-3.47
0.1600	19.02	18.34	16.06	12.41	7.89	3.51	0.72	-1.46	-3.51
0.2000	17.26	17.03	15.22	11.97	7.66	3.30	0.61	-1,55	-3.56
0.2500	15.17	15.44	14.13	11.33	7.31	2.99	0.44	-1.69	-3.68
0.3150	12.74	13.52	12.74	10.45	6.85	2.56	0.21	-1.88	-3.83
0.4000	9.95	11.25	11.00	9.32	6.24	1.99	-0.09	-2.15	-4.03
0.5000	7.09	8.87	9.10	8.03	5.55	1.34	-0.46	-2.51	-4.37
0.6300	3.85	6.13	6.86	6.47	4.66	0.39	-1.00	-3.07	-4.87
0.8000	0.20	2.95	4.15	4.39	3.43	-0.96	-1.67	-3.76	-5.48
1.0000	-3.63	-0.47	1.15	1.97	1.96	-2.60	-2.35	-4.47	-6.09
1.2500	-8.19	-4.65	-2.55	-1.01	0.13	-4.64	-3.01	-4.77	-6.02
1.6000	-14.24	-10.29	-7.60	-4.98	-2.22	-7.19	-3.68	-4.86	-5.93
2.0000	-20.47	-16.02	-12.62	-9.21	-4.98	-10.26	-4.14	-4.87	-5.82
2.5000	-28.47	-23.77	-19.75	-15.13	-8.62	-14.12	-4.45	-4.80	-5.68
3.1500	-40.03	-34.75	-29.57	-23.04	-13.32	-18.95	-4.60	-4.71	-5.58
4.0000	-55.49	-49.26	-42.33	-33.14	-19.21	-24.87	-4.60	-4.60	-5.52
5.0000	-73.25	-65.82	-56.76	-44.40	-25.66	-31.25	-4.42	-5.66	-7.57
6.3000	-95.09	-86.07	-74.25	-58.13	-33.81	-39.67	-4.18	-5.99	-7.77
8.0000	-122.88	-112.32	-97.64	-76.81	-44.62	-50.64	-4.25	-4.86	-5.92
10.0000	-156.99	-143.70	-125.30	-98.89	-57.47	-63.58	-4.40	-4.32	-6.47

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Table 10. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.5$ (Continued).

$M_j = 0.7$	θ_{jet} - Forward Quardrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-5.35	-7.08	-8.59	-9.96	-11.23	-12.41	-13.43	-14.15
0.0630	-5.36	-7.08	-8.59	-9.96	-11.23	-12.41	-13.42	-14.12
0.0800	-5.36	-7.09	-8.60	-9.96	-11.22	-12.40	-13.41	-14.11
0.1000	-5.37	-7.09	-8.60	-9.96	-11.22	-12.38	-13.38	-14.06
0.1250	-5.38	-7.10	-8.61	-9.95	-11.20	-12.36	-13.32	-13.96
0.1600	-5.42	-7.13	-8.62	-9.95	-11.18	-12.31	-13.23	-13.80
0.2000	-5.47	-7.17	-8.64	-9.95	-11.16	-12.25	-13.12	-13.60
0.2500	-5.55	-7.22	-8.66	-9.95	-11.12	-12.18	-12.99	-13.35
0.3150	-5.65	-7.28	-8.69	-9.94	-11.08	-12.07	-12.79	-12.97
0.4000	-5.81	-7.38	-8.74	-9.93	-11.01	-11.92	-12.49	-12.35
0.5000	-6.04	-7.51	-8.79	-9.93	-10.92	-11.74	-12.14	-11.60
0.6300	-6.38	-7.69	-8.87	-9.91	-10.81	-11.52	-11.74	-10.67
0.8000	-6.81	-7.92	-8.96	-9.90	-10.68	-11.26	-11.54	-11.27
1.0000	-7.09	-8.10	-9.06	-9.88	-10.55	-11.04	-11.47	-12.32
1.2500	-7.14	-8.22	-9.13	-9.87	-10.45	-10.88	-11.38	-13.07
1.6000	-7.16	-8.31	-9.19	-9.87	-10.39	-10.78	-11.27	-13.53
2.0000	-7.13	-8.35	-9.22	-9.86	-10.38	-10.75	-11.15	-13.53
2.5000	-7.08	-8.36	-9.22	-9.86	-10.39	-10.78	-11.03	-13.13
3.1500	-7.02	-8.34	-9.20	-9.87	-10.42	-10.83	-11.09	-11.12
4.0000	-7.33	-8.44	-9.18	-9.87	-10.42	-10.86	-11.04	-9.78
5.0000	-7.98	-8.48	-9.20	-9.87	-10.42	-10.87	-10.83	-10.63
6.3000	-7.48	-8.40	-9.21	-9.87	-10.42	-10.84	-11.06	-11.59
8.0000	-6.93	-8.33	-9.22	-9.87	-10.42	-10.75	-12.12	-11.76
10.0000	-7.20	-8.36	-9.21	-9.87	-10.42	-10.62	-13.69	-11.66

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Table 10. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.5$ (Continued).

$M_j = 0.9$	θ_{jet} - Aft Quadrant								
fD/a_o	10	20	30	40	50	60	70	80	90
0.0500	32.50	30.01	25.58	19.58	12.68	6.38	2.22	-0.76	-3.43
0.0630	31.44	29.28	25.13	19.35	12.59	6.33	2.19	-0.77	-3.44
0.0800	30.09	28.33	24.56	19.04	12.44	6.25	2.15	-0.79	-3.45
0.1000	28.54	27.18	23.79	18.62	12.25	6.14	2.10	-0.83	-3.47
0.1250	26.59	25.69	22.79	18.07	12.00	6.00	2.02	-0.85	-3.51
0.1600	24.07	23.69	21.38	17.26	11.63	5.81	1.94	-0.92	-3.58
0.2000	21.50	21.59	19.83	16.36	11.25	5.55	1.77	-1.07	-3.67
0.2500	18.77	19.33	18.08	15.23	10.68	5.15	1.51	-1.30	-3.85
0.3150	15.82	16.80	15.99	13.76	9.88	4.59	1.15	-1.62	-4.10
0.4000	12.44	13.86	13.51	11.93	8.82	3.85	0.68	-2.04	-4.42
0.5000	8.98	10.83	10.93	9.93	7.62	3.00	0.14	-2.58	-4.90
0.6300	5.09	7.38	7.96	7.54	6.16	1.90	-0.58	-3.32	-5.54
0.8000	0.69	3.47	4.56	4.63	4.14	0.41	-1.37	-4.08	-6.15
1.0000	-3.92	-0.86	0.53	1.25	1.76	-1.29	-2.06	-4.69	-6.52
1.2500	-9.74	-6.31	-4.43	-2.96	-1.18	-3.27	-2.64	-4.86	-6.45
1.6000	-17.85	-13.99	-11.36	-8.70	-5.20	-5.66	-2.98	-4.84	-6.46
2.0000	-26.94	-22.60	-19.19	-14.66	-9.12	-8.30	-3.22	-4.92	-6.55
2.5000	-37.66	-32.33	-27.61	-22.26	-14.67	-11.69	-3.40	-5.13	-6.76
3.1500	-51.19	-45.78	-40.29	-33.11	-22.15	-15.99	-3.51	-5.46	-7.05
4.0000	-71.35	-65.12	-57.80	-47.53	-31.75	-21.29	-3.57	-5.89	-7.42
5.0000	-95.83	-88.17	-78.23	-64.02	-42.50	-27.07	-3.57	-5.51	-6.90
6.3000	-127.10	-117.32	-103.70	-84.24	-55.45	-34.34	-3.86	-4.58	-6.86
8.0000	-165.89	-153.15	-134.65	-109.91	-73.05	-44.01	-3.76	-4.70	-7.36
10.0000	-209.63	-194.93	-172.72	-140.85	-93.76	-55.51	-3.62	-5.51	-6.49

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Table 10. Fluid Shrouding for Heated Jets, $\rho_i/\rho_o = 0.5$ (Concluded).

$M_j = 0.9$	θ_{jet} - Forward Quadrant							
fD/a_o	100	110	120	130	140	150	160	170
0.0500	-5.88	-8.05	-9.95	-11.67	-13.28	-14.76	-16.03	-16.92
0.0630	-5.89	-8.05	-9.95	-11.66	-13.26	-14.74	-15.99	-16.85
0.0800	-5.90	-8.06	-9.95	-11.66	-13.25	-14.71	-15.96	-16.81
0.1000	-5.91	-8.06	-9.95	-11.65	-13.22	-14.66	-15.87	-16.67
0.1250	-5.92	-8.08	-9.95	-11.62	-13.17	-14.58	-15.73	-16.41
0.1600	-5.98	-8.10	-9.94	-11.59	-13.09	-14.44	-15.49	-16.00
0.2000	-6.06	-8.14	-9.94	-11.54	-13.00	-14.28	-15.22	-15.51
0.2500	-6.17	-8.19	-9.93	-11.48	-12.88	-14.07	-14.87	-14.90
0.3150	-6.31	-8.25	-9.93	-11.40	-12.71	-13.78	-14.37	-13.92
0.4000	-6.53	-8.34	-9.92	-11.29	-12.46	-13.39	-13.72	-12.60
0.5000	-6.84	-8.47	-9.91	-11.15	-12.19	-12.99	-13.24	-12.13
0.6300	-7.20	-8.62	-9.90	-10.99	-11.88	-12.59	-13.15	-13.43
0.8000	-7.56	-8.77	-9.88	-10.85	-11.62	-12.26	-12.74	-12.01
1.0000	-7.68	-8.80	-9.88	-10.75	-11.44	-12.03	-12.40	-11.04
1.2500	-7.66	-8.82	-9.87	-10.69	-11.33	-11.88	-12.13	-10.47
1.6000	-7.69	-8.85	-9.87	-10.65	-11.26	-11.78	-11.93	-10.46
2.0000	-7.78	-8.89	-9.87	-10.64	-11.26	-11.77	-11.84	-10.96
2.5000	-7.93	-8.94	-9.87	-10.66	-11.30	-11.83	-11.82	-11.96
3.1500	-8.13	-9.00	-9.87	-10.68	-11.35	-11.85	-11.91	-13.87
4.0000	-8.06	-8.82	-9.87	-10.68	-11.35	-11.84	-12.30	-13.25
5.0000	-7.66	-8.70	-9.87	-10.68	-11.35	-11.83	-12.56	-11.86
6.3000	-7.70	-8.73	-9.87	-10.68	-11.35	-11.82	-12.31	-11.39
8.0000	-7.98	-8.90	-9.87	-10.67	-11.35	-11.84	-11.55	-11.49
10.0000	-8.34	-9.18	-9.88	-10.66	-11.35	-11.86	-10.42	-12.04

Note: The above is a table of Δ SPL's which should be applied to the 90° spectrum.

Experimental investigations (References 13, 190-193) have provided some useful information on the sound pressure spectra and constant sound pressure contours of the near noise field of jets under particular operating conditions. To estimate near noise field, there exist semiempirical methods based on near-field noise measurement from full-scale jet engines (Reference 194) and based on tests from scale-model hot jets (Reference 195). However, there is definitely the lack of a basic understanding of the near noise field and, therefore, the lack of an accurate prediction procedure.

Here, the method of calculation as described for the far-field acoustic approximations is applied to the near sound field. The formulations are based on quadrupole distributions studied by Franz (Reference 196). Extensive calculations with the models to be discussed may be found in References 78 and 197.

Discussion of Models

Equation 311 was a general solution to Lighthills inhomogeneous wave equation for far-field and near-field sound due to a distribution of quadrupoles:

$$p'(\vec{r},t) = \frac{1}{4\pi} \iiint \left[\frac{(x_i-y_i)(x_j-y_j)}{R^2} \left(\frac{\ddot{T}_{ij}}{Ra_o^{\,2}} + 3\,\frac{\dot{T}_{ij}}{R^2 a_o} + 3\,\frac{T_{ij}}{R^3} \right) - \delta_{ij} \left(\frac{\dot{T}_{ij}}{R^2 a_o} + \frac{T_{ij}}{R^3} \right) \right] dV_o$$

Under the assumptions that the turbulence is essentially steady and the distance R is large compared to the eddy size, Franz (Reference 196) shows that the mean-square sound pressures due to the distribution of different types of quadrupoles can be written in terms of the radiated acoustic power W as:

$$\overline{(p - p_o)^2} = \frac{\rho_o a_o W}{4\pi R^2} \left(15 \sin^2\theta \cos^2\theta \cos^2\phi\right) \left(1 + 3\,\frac{a_o^{\,2}}{R^2\omega^2} + 9\,\frac{a_o^{\,4}}{R^4\omega^4}\right) \qquad (332)$$

for a lateral quadrupole:

$$\overline{(p - p_o)^2} = \frac{\rho_o a_o W}{4\pi R^2} (5 \cos^4\theta) \left[1 + \frac{a_o^2}{R^2 \omega^2} \left(3 - \frac{4}{\cos^2\theta} + \frac{1}{\cos^4\theta}\right) + \frac{a_o^4}{R^4 \omega^4} \left(9 - \frac{6}{\cos^2\theta} + \frac{1}{\cos^4\theta}\right)\right] \quad (333)$$

for a longitudinal quadrupole, and:

$$\overline{(p - p_o)^2} = \frac{\rho_o a_o W}{4\pi R^2} \left(1 + 2 \frac{a_o^2}{R^2 \omega^2} + 12 \frac{a_o^4}{R^4 \omega^4}\right) \quad (334)$$

for quadrupole radiation from an isotropic turbulence.

These expressions were obtained based on a small flow velocity, so that the effects of source convection do not appear. For non-negligible convection speed, the expressions can be written as (Appendix C of Reference 196):

$$\overline{(p - p_o)^2} = \frac{\rho_o a_o W}{4\pi R^2} (15 \sin^2\theta \cos^2\phi) \left[\cos^2\theta + \frac{a_o^2}{R^2 \omega^2} (3 Q^2 \cos^2\theta - 6 M_c Q \cos\theta + 4M_c^2) + \frac{a_o^4}{R^4 \omega^4} (9 Q^4 \cos^2\theta - 18 M_c Q^3 \cos\theta + 9 M_c^2 Q^2)\right] C^{-5} \quad (335)$$

for a lateral quadrupole:

$$\overline{(p - p_o)^2} = \frac{\rho_o a_o W}{4\pi R^2} \left\{ \cos^4\theta + \frac{a_o^2}{R^2 \omega^2} \left[3 Q^2 \cos^4\theta - 12 M_c Q \cos^3\theta - (4 - 9M_c^2) \cos^2\theta + 6 M_c \cos\theta + 1\right] + \frac{a_o^4}{R^4 \omega^4} \left[9 Q^4 \cos^4\theta\right.\right.$$

$$- 36\, M_c\, Q^3 \cos^3\theta - 6\left(1 - 9\, M_c^{\,2}\right) Q^2 \cos^2\theta$$

$$+ 12\left(1 - 3M_c^{\,2}\right) Q\, M_c \cos\theta + \left(1 - 3\, M_c^{\,2}\right)^2 \Bigg] \Bigg\} \; C^{-5} \qquad (336)$$

for a longitudinal quadrupole:

$$\overline{\left(p - p_o\right)^2} = \frac{\rho_o a_o W}{4\pi R^2} \left(1 + 2\, \frac{a_o^{\,2}}{R^2 \omega^2} + 12\, \frac{a_o^{\,4}}{R^4 \omega^4}\right) C^{-5} \qquad (337)$$

for quadrupole radiation from an isotropic turbulence, where:

$$C = \left[\left(1 - M_c \cos\theta\right)^2 + \left(\frac{\omega \ell}{a_o}\right)^2\right]^{1/2}$$

$$Q = \frac{1 - M_c}{\left[\left(1 - M_c \cos\theta\right)^2 + \left(\frac{\omega \ell}{a_o}\right)^2\right]^{1/2}}$$

The factor C used here, which is obtained by Ffowcs-Williams for high-speed flow, replaces Franz' original form $(1 - M_c \cos\theta)$. The factor C^{-5} in equations (335) to (337) also replaces C^{-6} of Franz' form to account for the increased number (C) of eddies whose sound arrives at the field point simultaneously. It is easy to see that, when M_c is small compared to unity, both C and Q approach unity and equations (335) to (337) reduce to equations (332) to (334). Thus, equations (335) to (337) are valid for both low-speed and high-speed flows.

Method of Calculation

The mean square sound pressures given above can be considered as contributions due to a unit volume of jet flow. The idealized structure of a turbulent jet may be divided into several regions. The initial region consists of a potential core enclosed by a mixing region of strong shear. Downstream of it are the transition region and the fully developed turbulent region. Different parts of the jet may be considered to generate sound by different types of quadrupoles. In the present investigation, each type of quadrupole is considered as an acoustic model for prediction, assuming that the entire jet flow is represented by one type of quadrupole. This is followed by investigation of compositions of different quadrupoles for different parts of the jet.

To express the near-field sound pressure in terms of mean flow and turbulence parameters throughout the entire jet flow, the following approximations are made:

$$\omega \approx 1.1\, u'/\ell$$

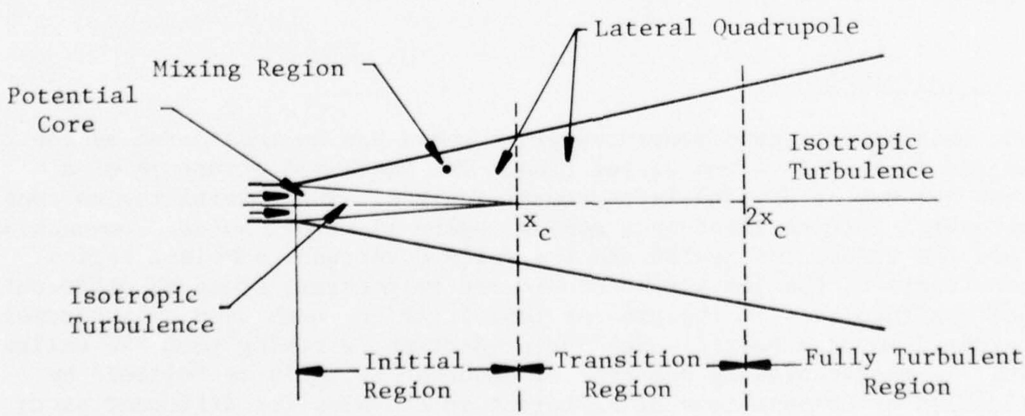
$$W \approx \beta_L \frac{\rho^2 u'^4 U^4}{\rho_o a_o^5 \ell}$$

where the terms are the same as those discussed earlier for the far-field noise approximations. The method of calculation for the far-field OASPL and SPL is also applied for the near-field calculations of NOISE.

From extensive theory/data comparisons it was found that, at certain near-field locations, one particular model may compare better with measurements than another. References 78 and 197 describe these results. To improve predictions by use of individual models, composite acoustic models were also considered. To do this it was necessary to consider the structure of the turbulent jet as divided into several regions: the initial region (consisting of a potential core enclosed by a mixing region of strong shear), the transition region (downstream of the potential core), and the fully turbulent region. The different parts of the jet are considered to generate sound by different acoustic sources.

Composite Model I

The isotropic turbulence model is used in the potential core and the fully turbulent region (see sketch below). The lateral quadrupole, which is usually considered to be predominant in any region with large mean shear, is used in the mixing region enclosing the potential core and in the transition region which is approximately one core length downstream of the potential core.



Composite Model II

The lateral quadrupole is used in the mixing region, and the isotropic turbulence model is used elsewhere for the jet flow.

Predictions with these two composite acoustic models have been made for a supersonic jet. Model I was found to be almost the same as the lateral quadrupole model except at low frequencies ($f < 1000$ Hz). Model II, the isotropic turbulence model, was found to be dominant for $f < 2500$ Hz.

Although these composite models were not found to yield much improvement on predictions, it was found that there exists the possibility of changing the predicted characteristics by changing the composition of the quadrupole models and, thus, through a better selection, possibly arriving at a better prediction.

Using any of the models described above, it was found that, by replacing the term $(\omega \ell / a_o)^2 \equiv (1.1\ u'/a_o)^2$ of the convective amplification terms by $q^2 = 0.5\ M_c$, improvements for the low frequency spectra were obtained. This option is available in NOISE.

It was also found that a much simplified model for the near field could be obtained by using any of the above single or composite models with measured far-field spectra.

Simplified Near-Field Prediction Procedure

As can be observed from the earlier work, the near-field prediction models can be written in the following functional form:

$$\overline{p'^2}(r,\omega) = \frac{P(\omega)}{4\pi R^2} \left(1 + A_1 \frac{a_o^2}{R^2 \omega^2} + A_2 \frac{a_o^4}{R^3 \omega^4} \right) F(\theta, M_c)$$

where:

$P(\omega)$ = the far-field acoustic power spectrum

$F(\theta, M_c)$ = the near-field directivity factors appropriate for any of the models described earlier

A_1, A_2 = the appropriate coefficients for the discussed near field

Further, if the source frequency distribution is assumed as a unique function of axial location, then, by using a measured far-field power spectrum, the near field can be simply computed for any observation point. An appropriate source frequency distribution is (Reference 156):

$$\frac{fD}{u_o} = \left(\alpha \frac{x}{D}\right)^{-\beta}$$

where D is the jet diameter, u_o is the isentropic exhaust speed, f is the observed frequency, and x is the axial location. The empirical constants are $\alpha = 1.25$ and $\beta = 1.22$ for circular jets.

EXAMPLES OF PREDICTIVE SCHEMES IN NOISE

Extensive comparisons have been performed using the far-field and near-field acoustic models described above. References 1, 10, 78, and 197 contain many such examples. Included here are some of the results obtained.

Far-Field Acoustic Predictions

Figures 286 to 292 show the prediction of NOISE for the Lighthill and the Lighthill Self-Noise/Shear-Noise Models. Figures 293 to 295 show predictions for the basic Lighthill and Ribner models.

Near-Field Acoustic Predictions

Figures 296 to 302 show example predictions using the developed near-field prediction schemes.

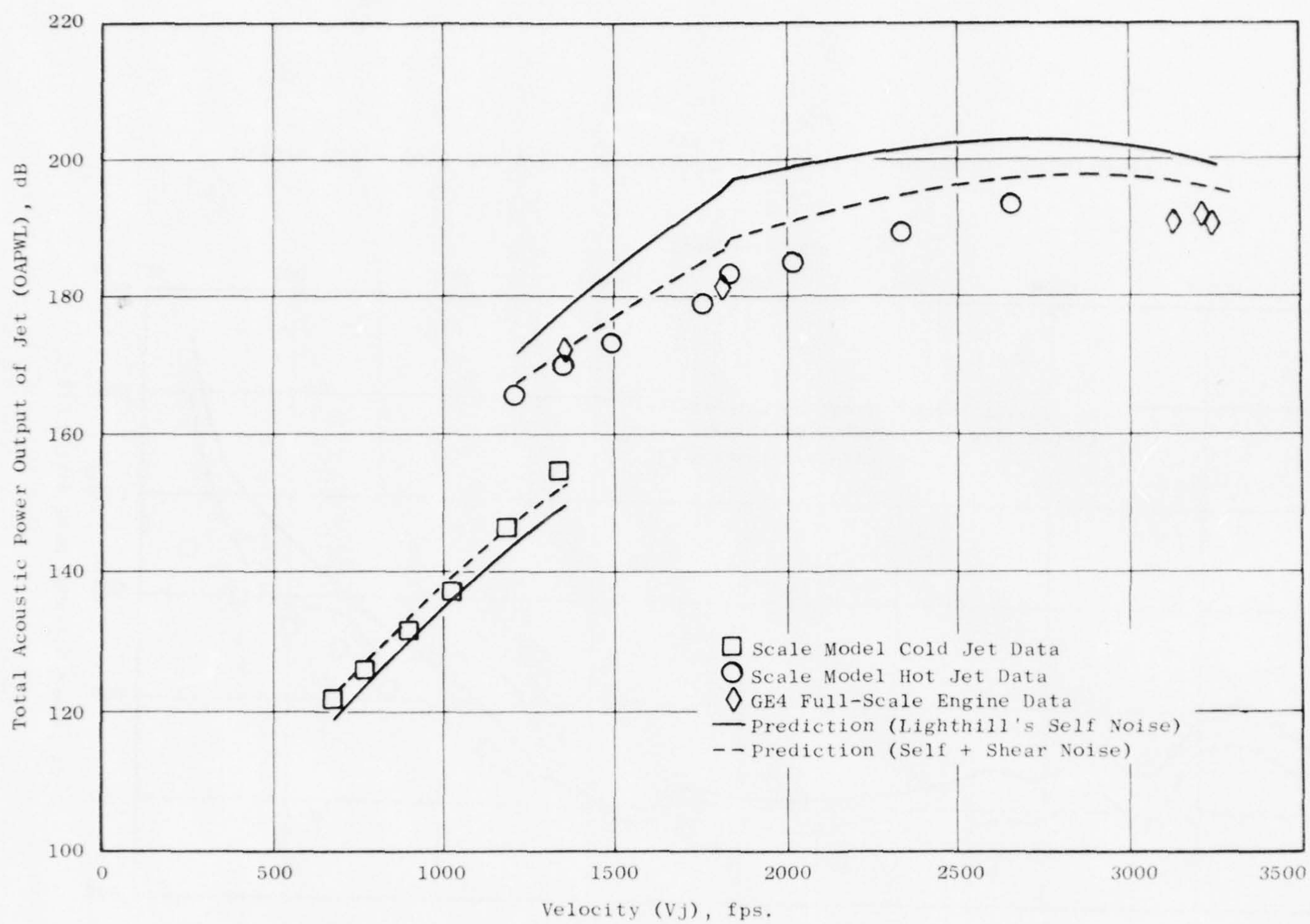


Figure 286. Prediction of Overall Power Level.

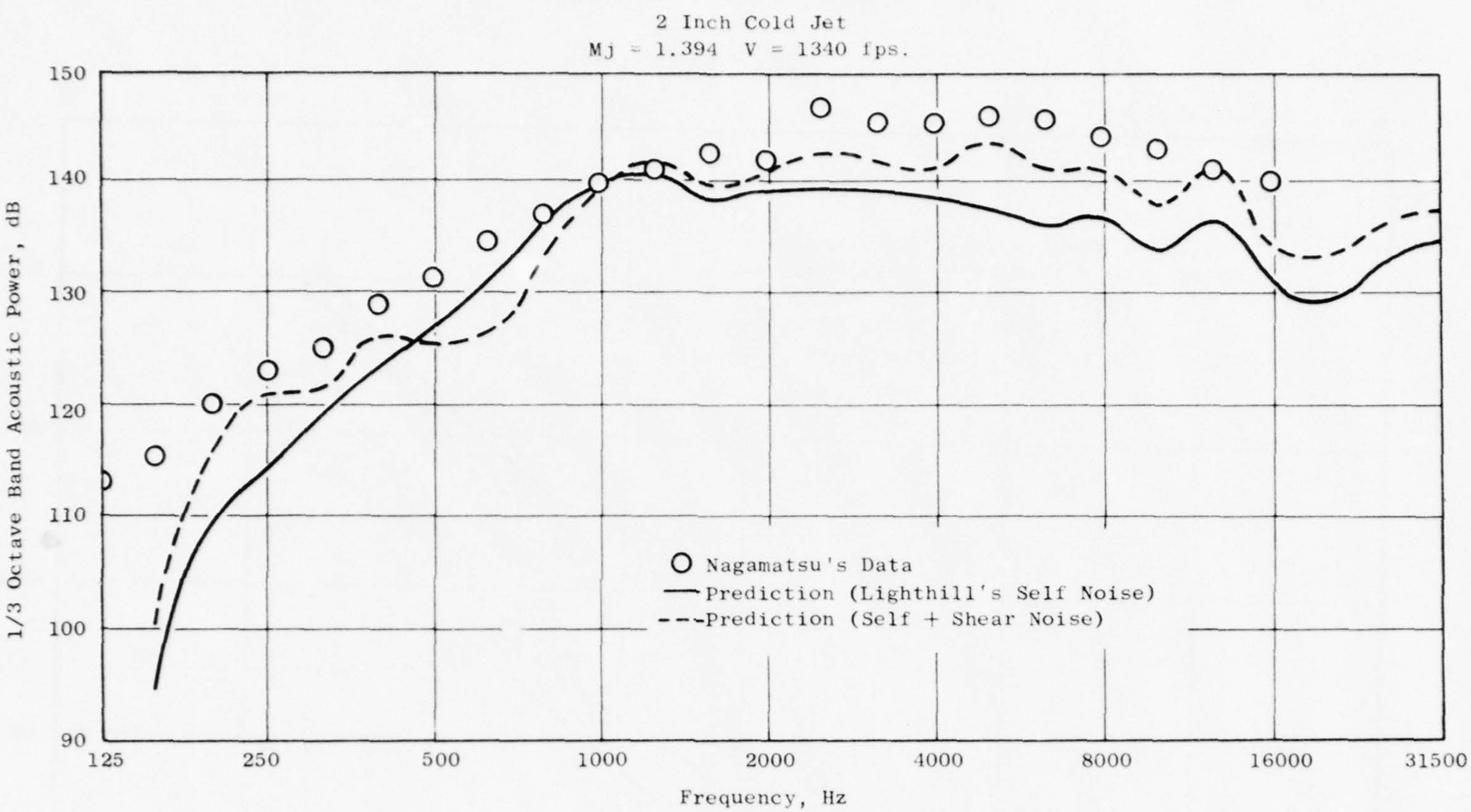


Figure 287. Cold Jet Power Spectrum Prediction Measurement Comparisons.

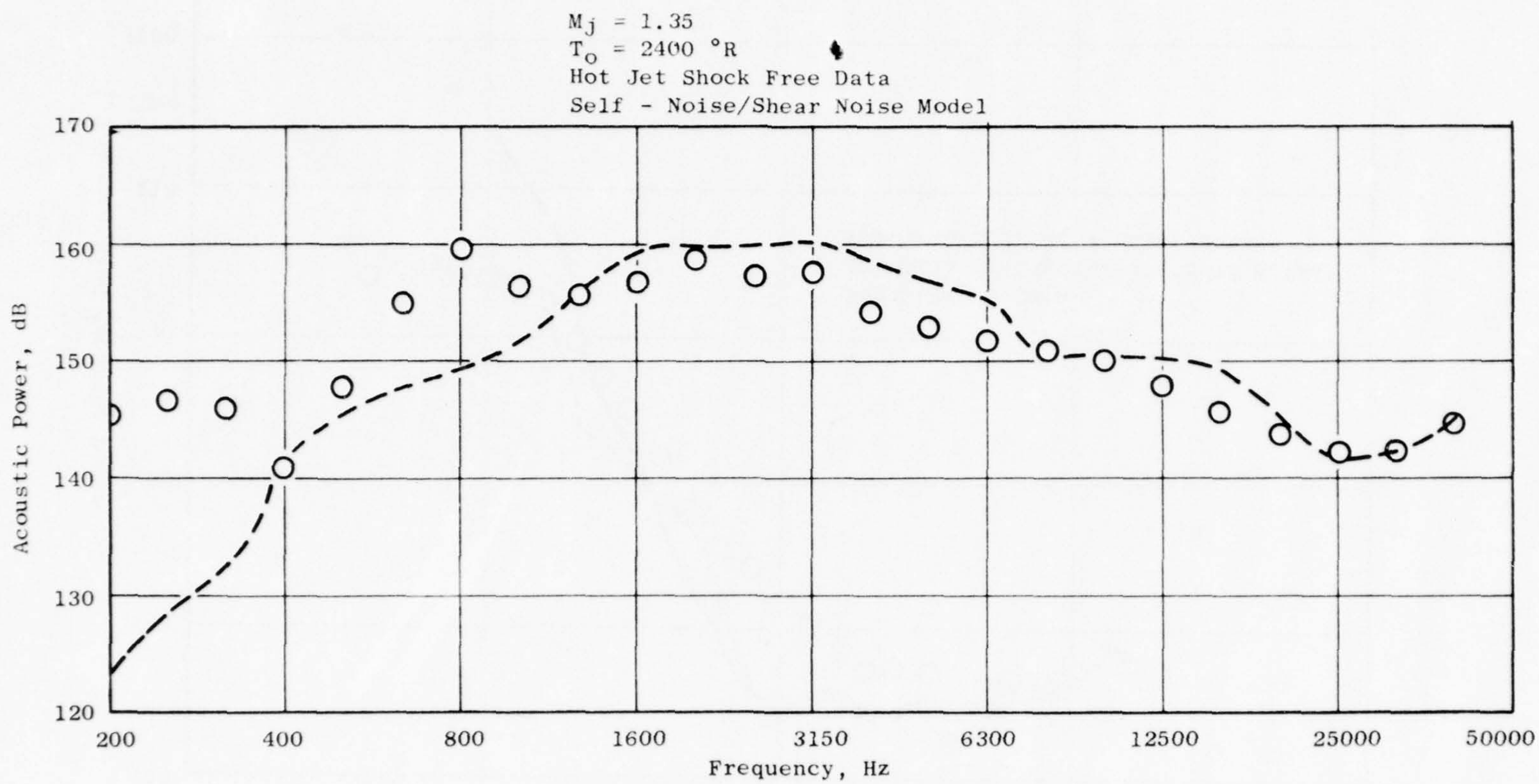


Figure 288. Hot Jet Power Spectrum Theory Data Comparisons for a Shock Free Supersonic Jet.

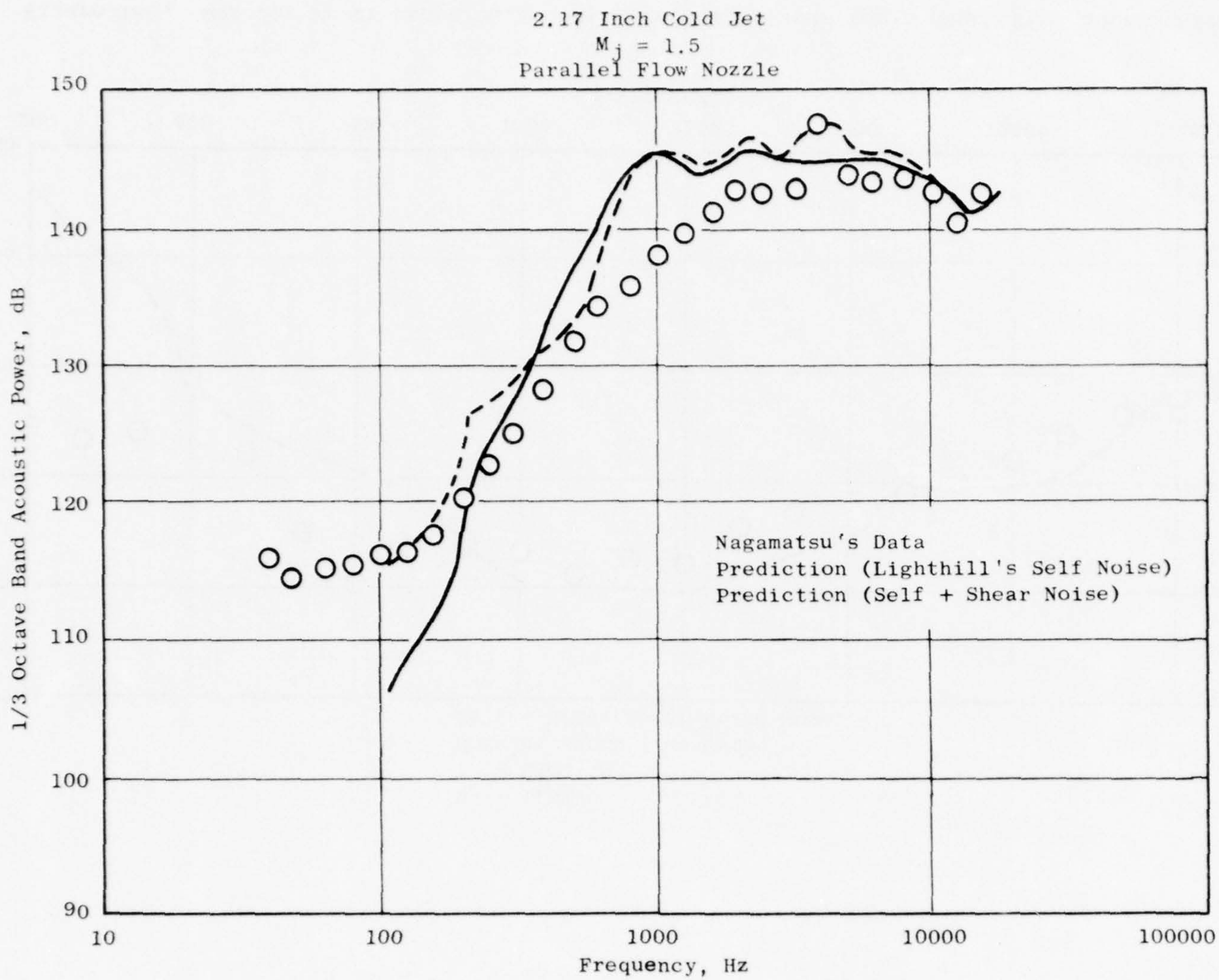


Figure 289. Cold Jet Power Spectrum Prediction Measurement Comparisons.

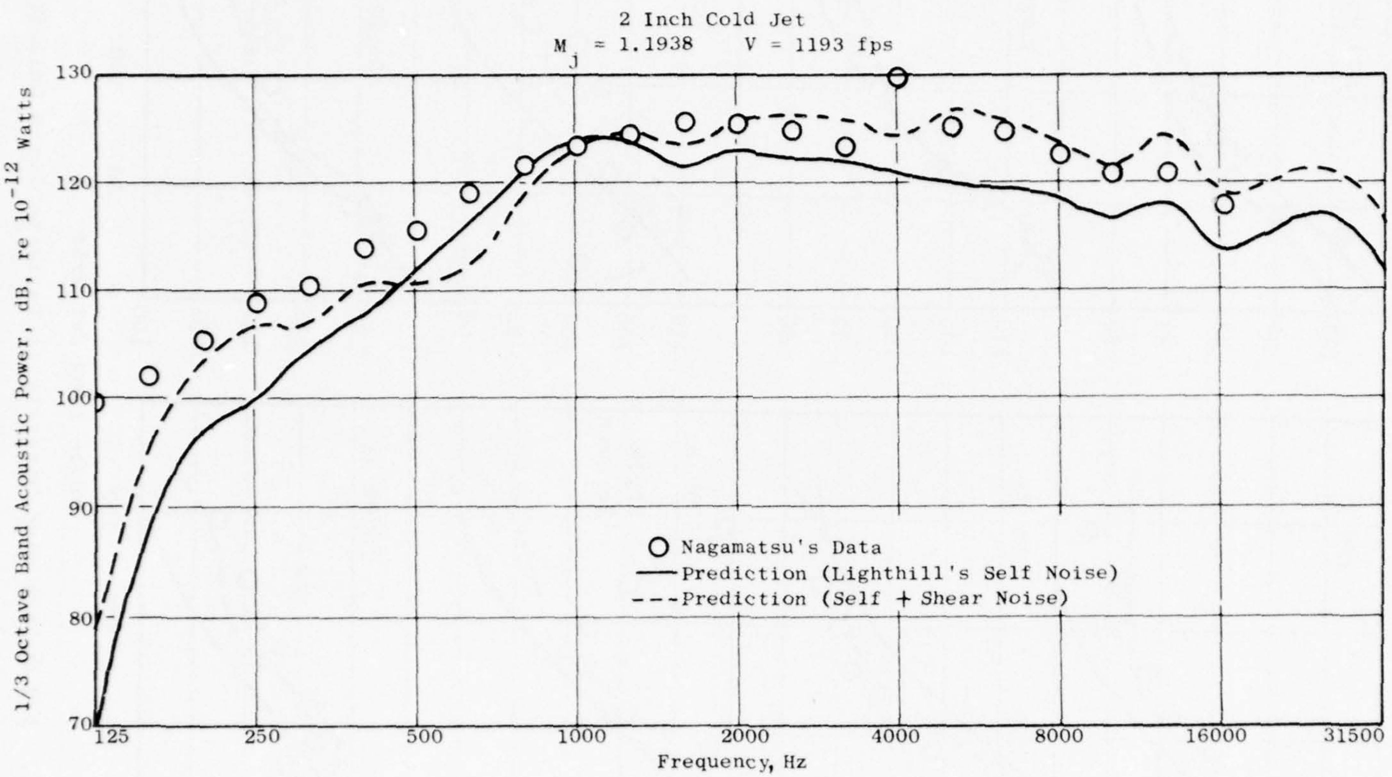


Figure 290. Cold Jet Power Spectrum Prediction Measurement Comparisons.

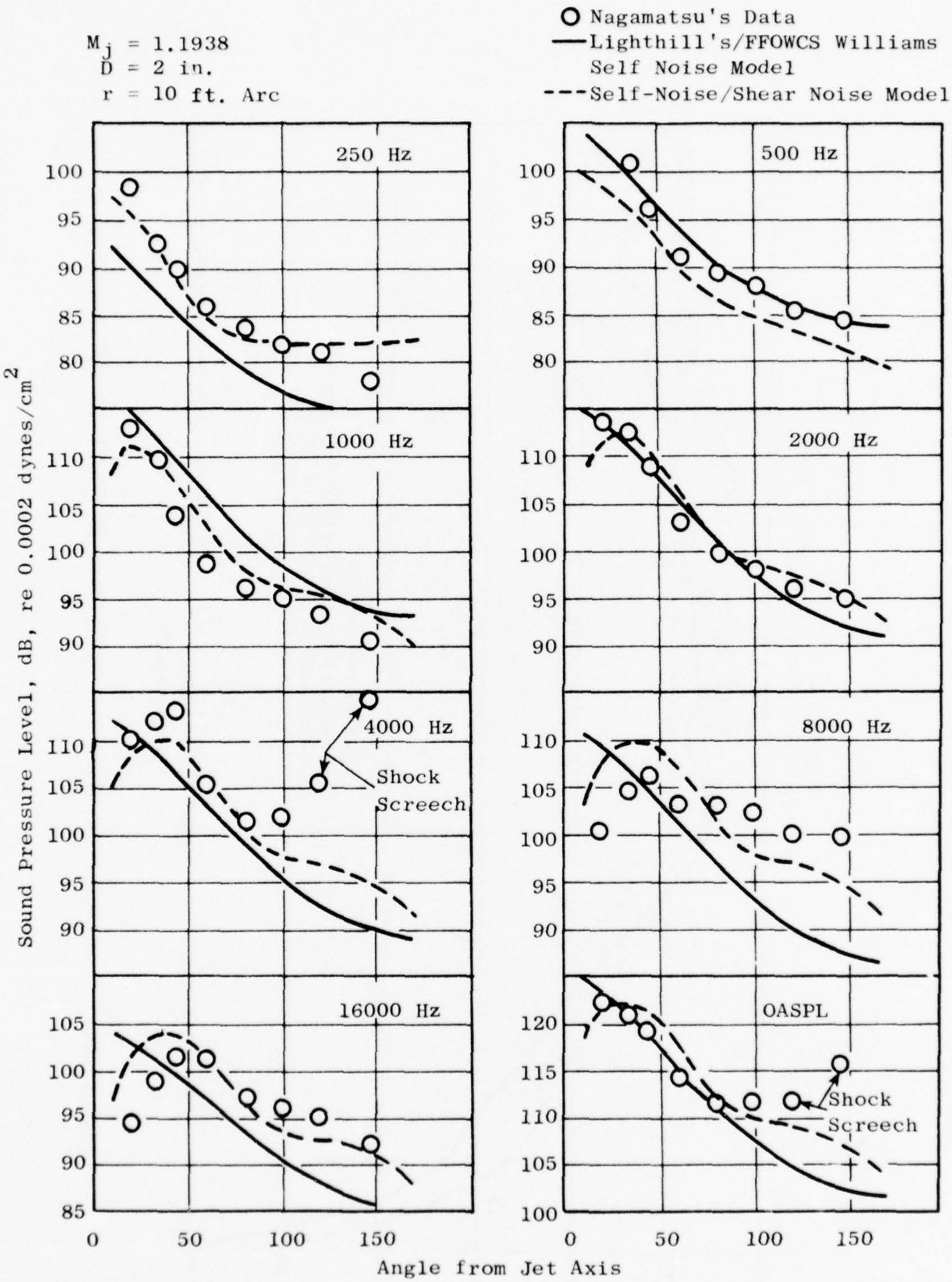


Figure 291. 1/3 Octave Band Directivity Patterns for a Cold Supersonic Jet.

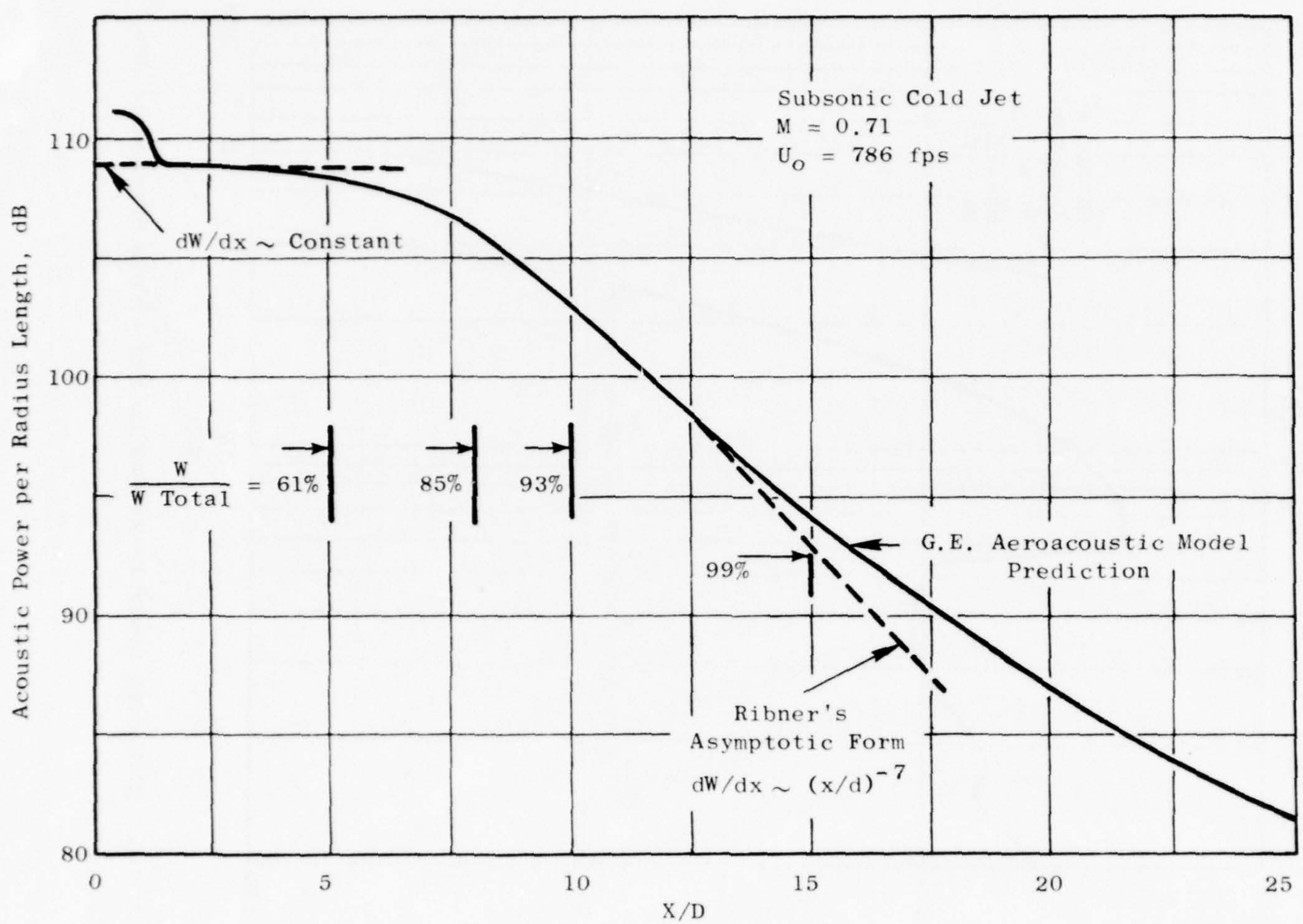


Figure 292. Predicted Power Distribution for a Cold Subsonic Jet.

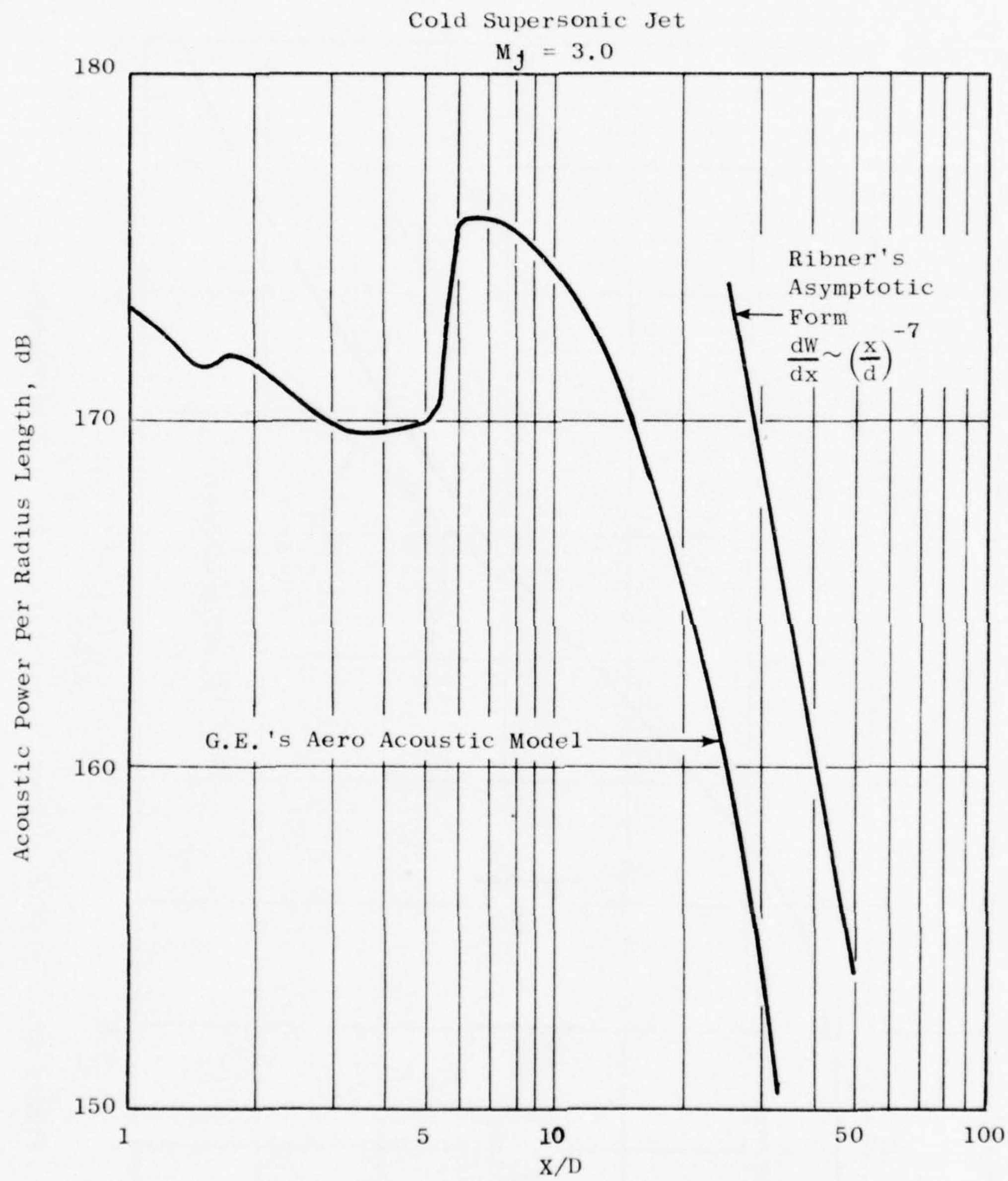


Figure 293. Predicted Power Distribution for a Cold Supersonic Jet.

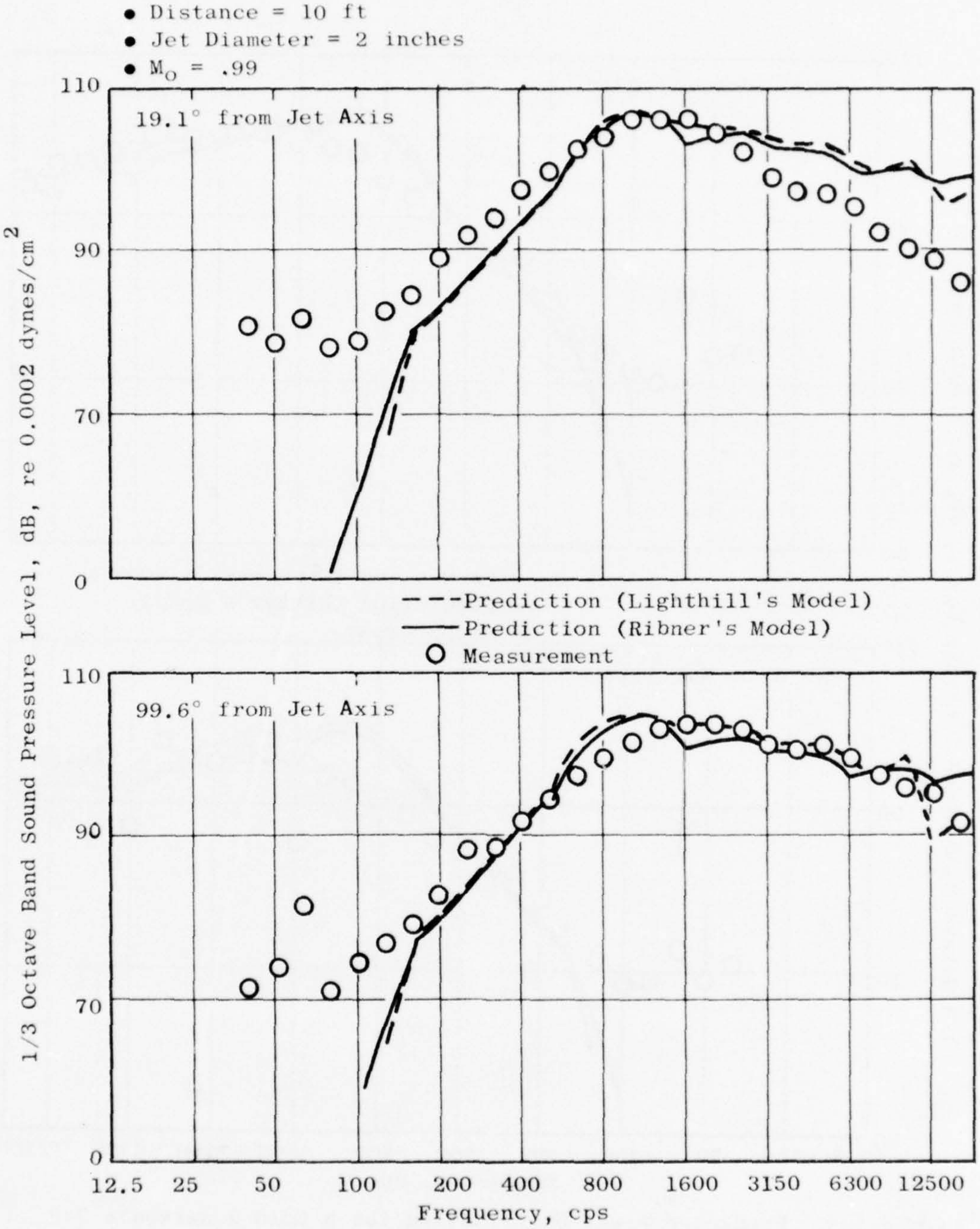


Figure 293. Predicted Power Distribution for a Cold Supersonic Jet (Continued).

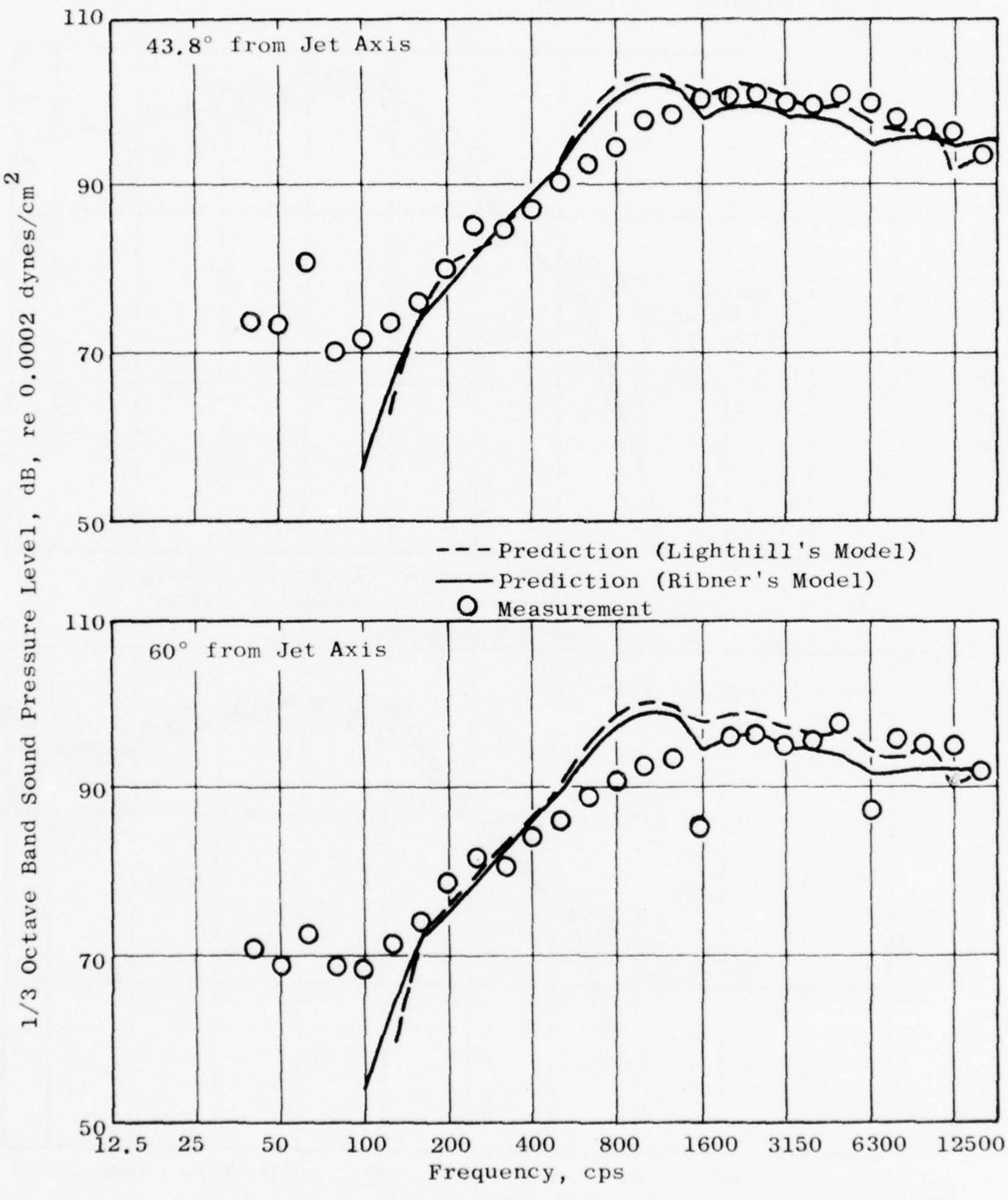


Figure 293. Predicted Power Distribution for a Cold Supersonic Jet (Continued).

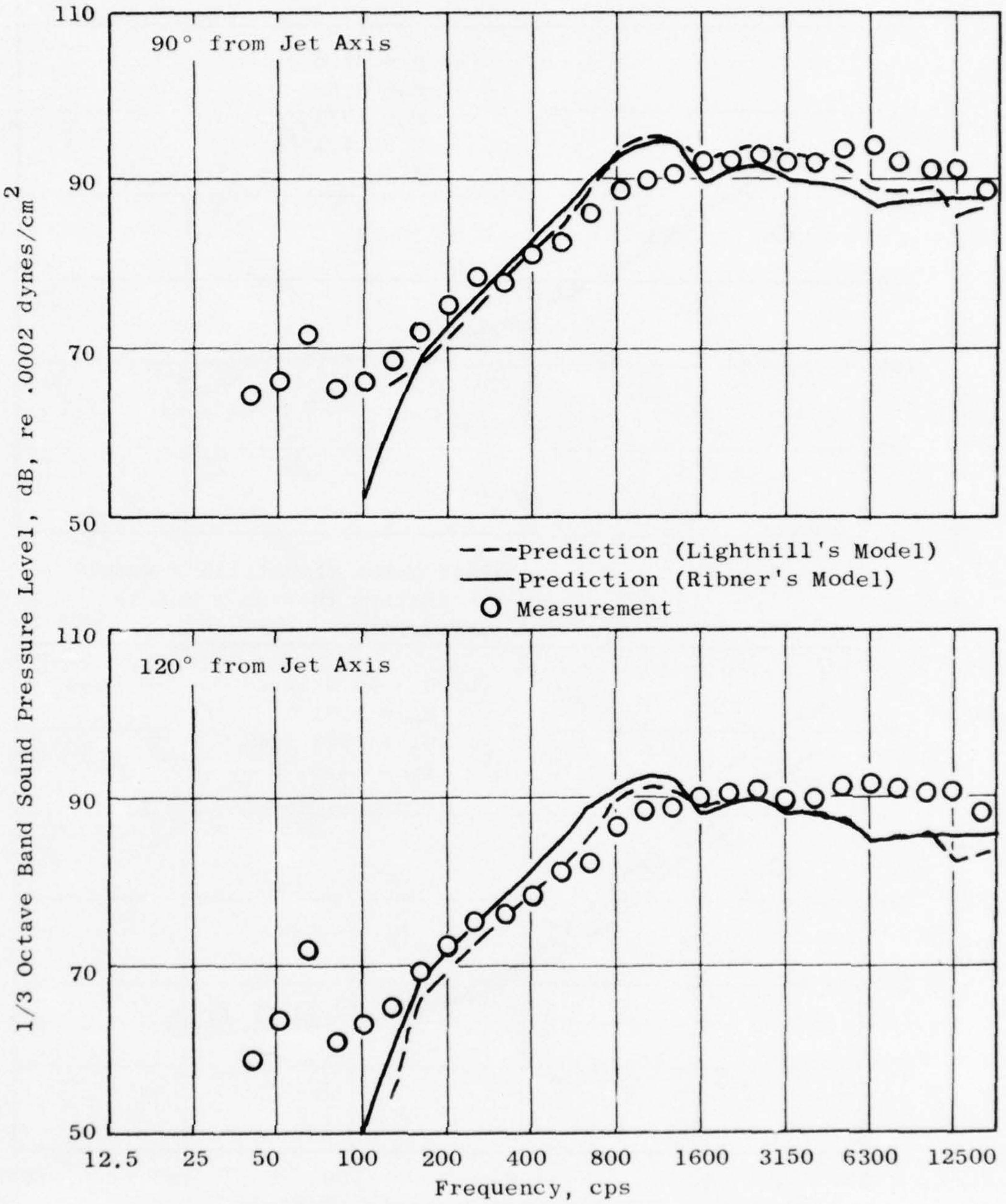


Figure 293. Predicted Power Distribution for a Cold Supersonic Jet (Concluded).

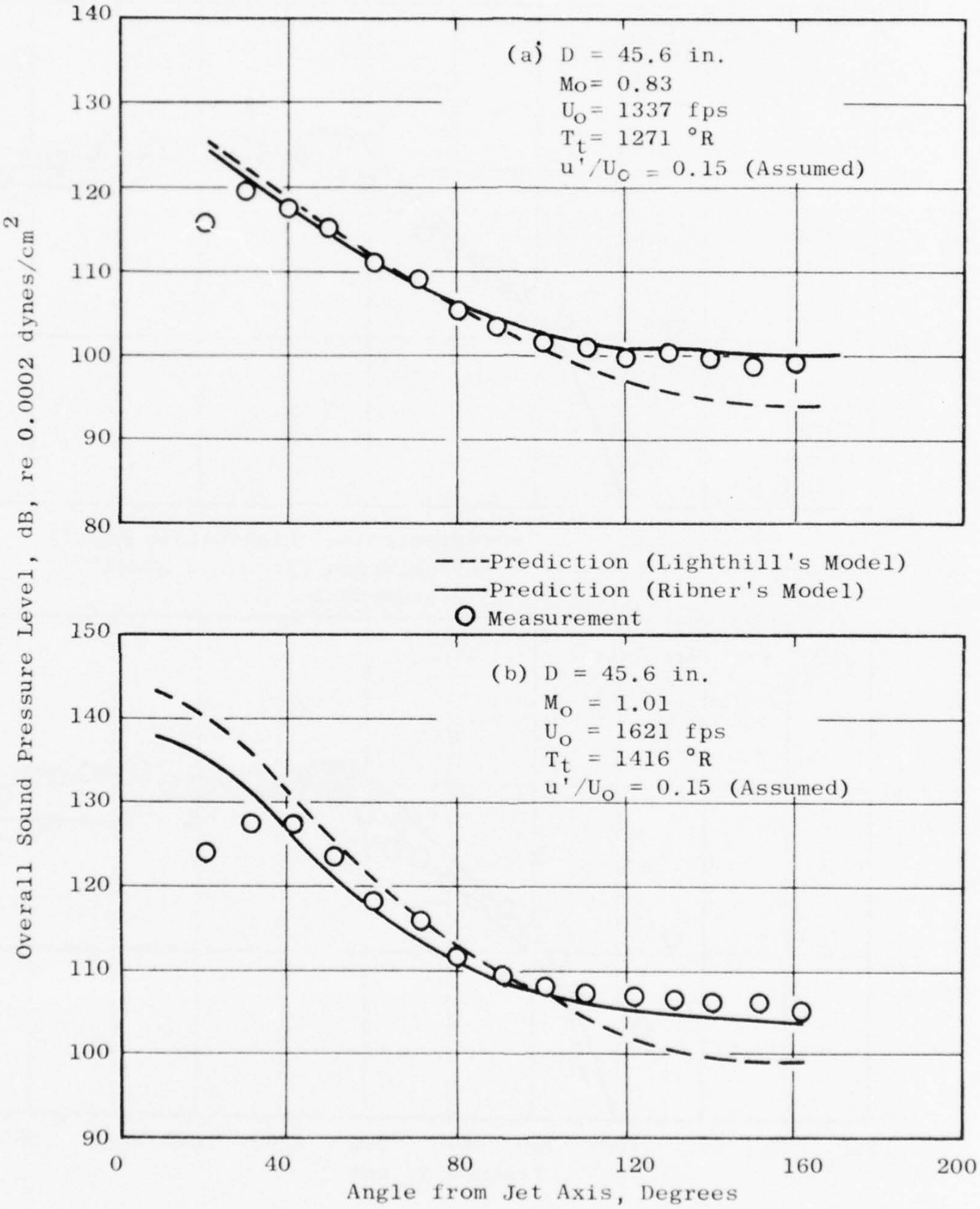


Figure 294. Directivity Patterns of Overall Sound Pressures for Hot Jets at a Distance of 320 feet from Jet Exit.

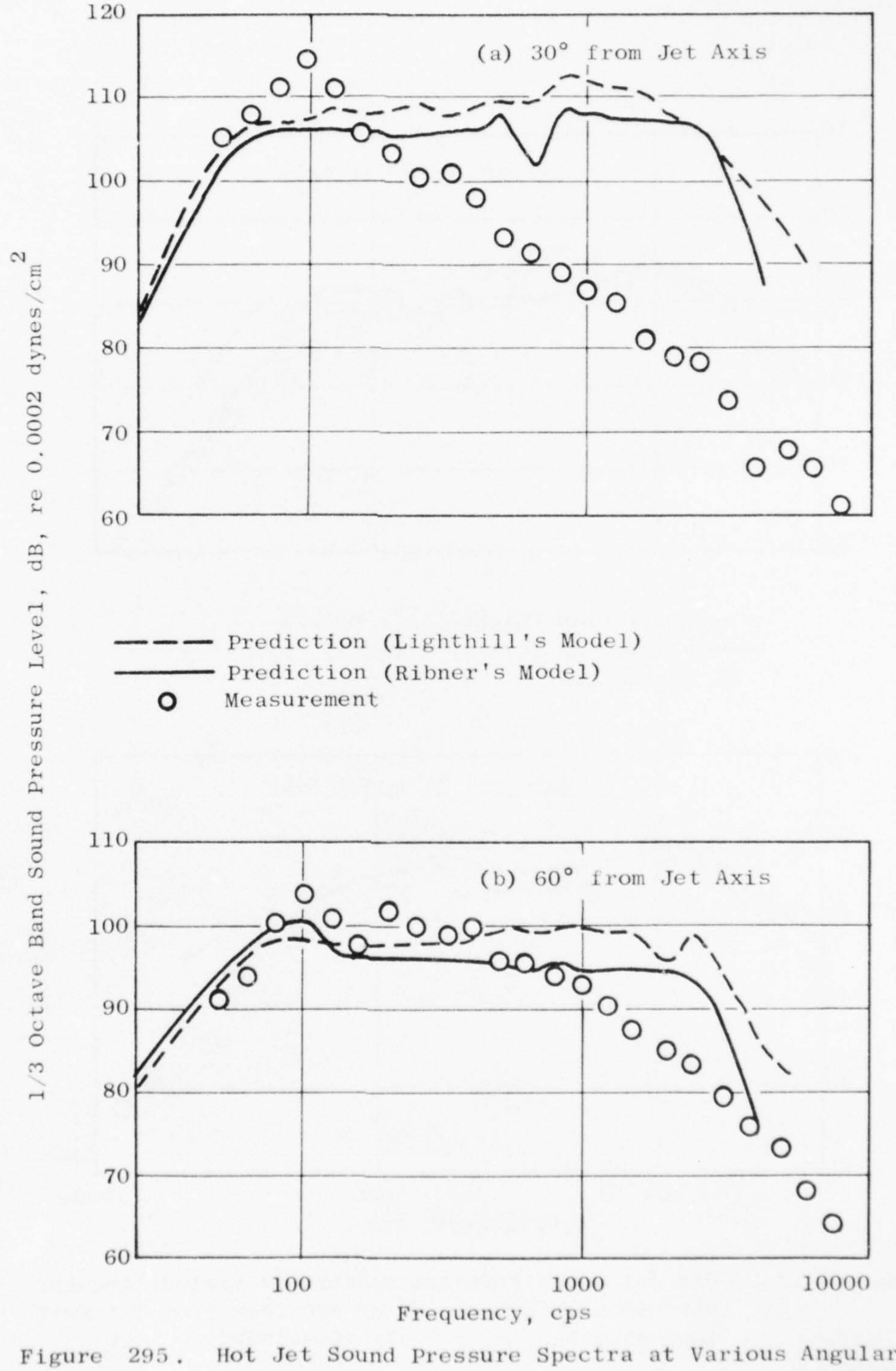


Figure 295. Hot Jet Sound Pressure Spectra at Various Angular Positions at a Distance of 320 feet from Jet Exit (D = 45.6 in., M_o = 0.83).

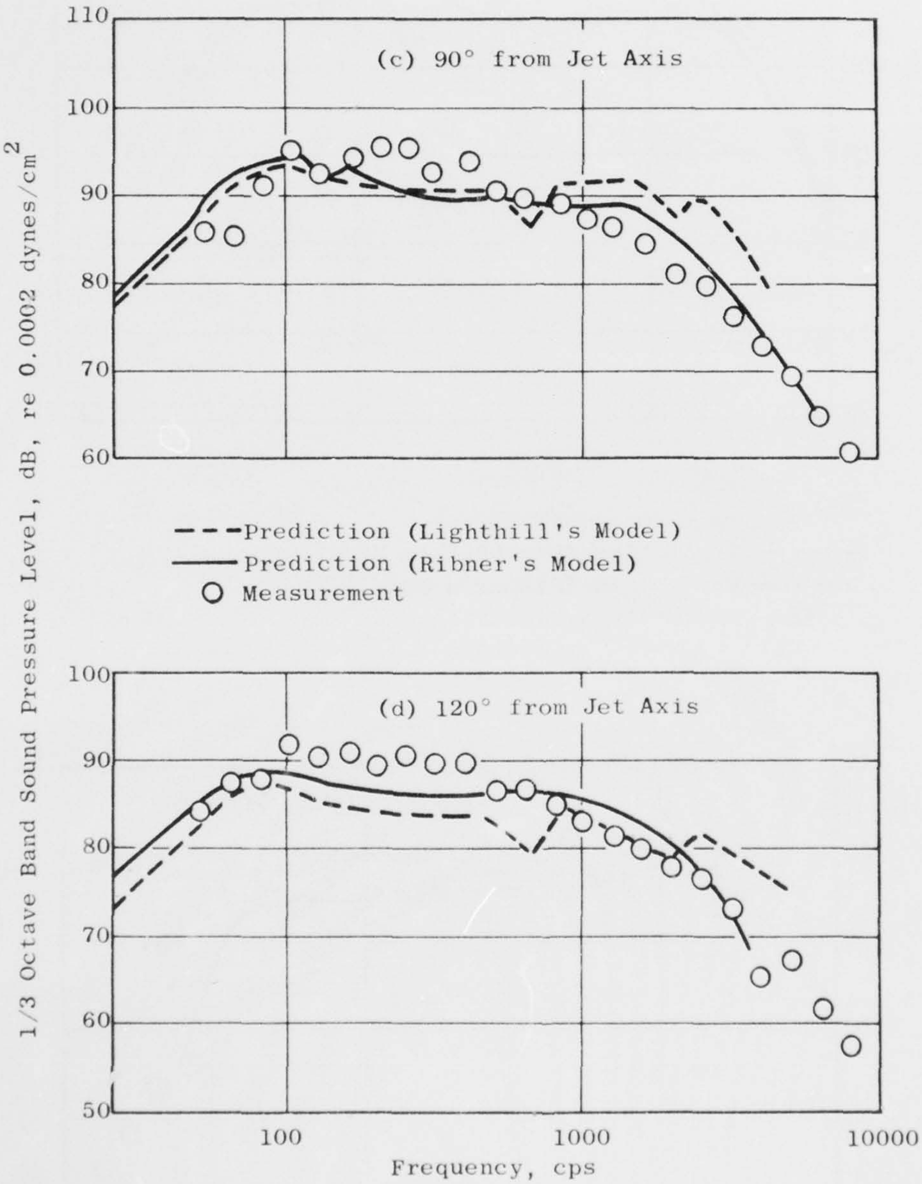


Figure 295. Hot Jet Sound Pressure Spectra at Various Angular Positions at a Distance of 320 feet from Jet Exit ($D = 45.6$ in., $M_o = 0.83$) (Concluded).

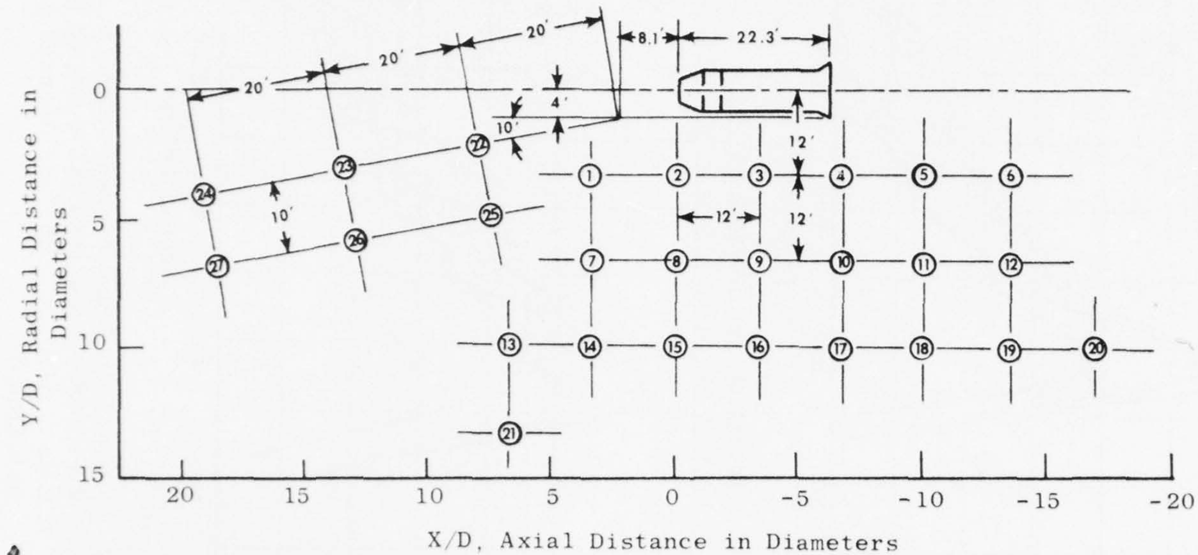
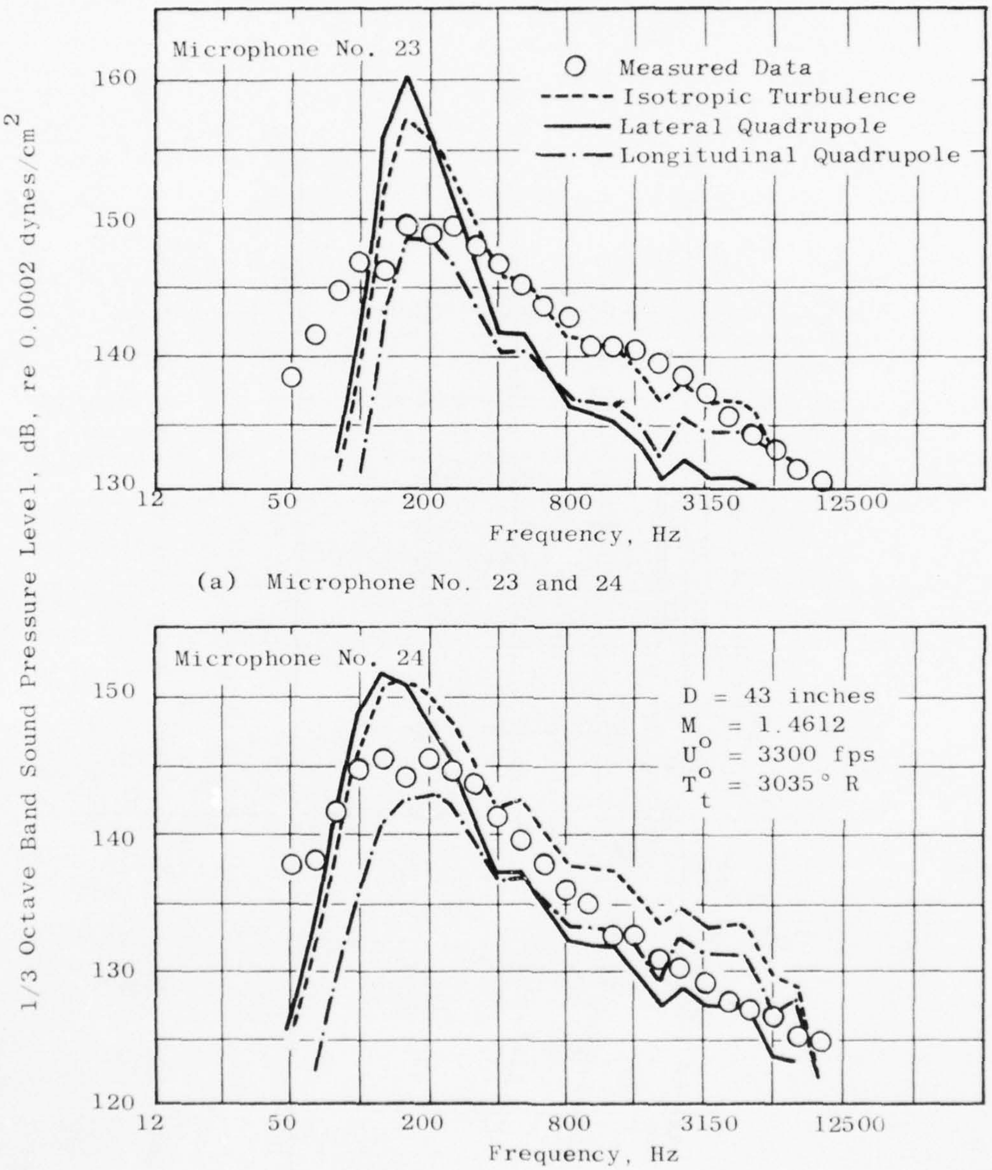


Figure 296. Near-Field Microphone Locations for a Full-Scale Jet Engine (D = 43 in.).



(a) Microphone No. 23 and 24

Figure 297. Near-Field Sound Pressure Spectra at Various Microphone Locations (An Initial Turbulence Level, $u'/U_o = 0.15$, was Assumed for the Calculations).

(c) Microphone No. 27

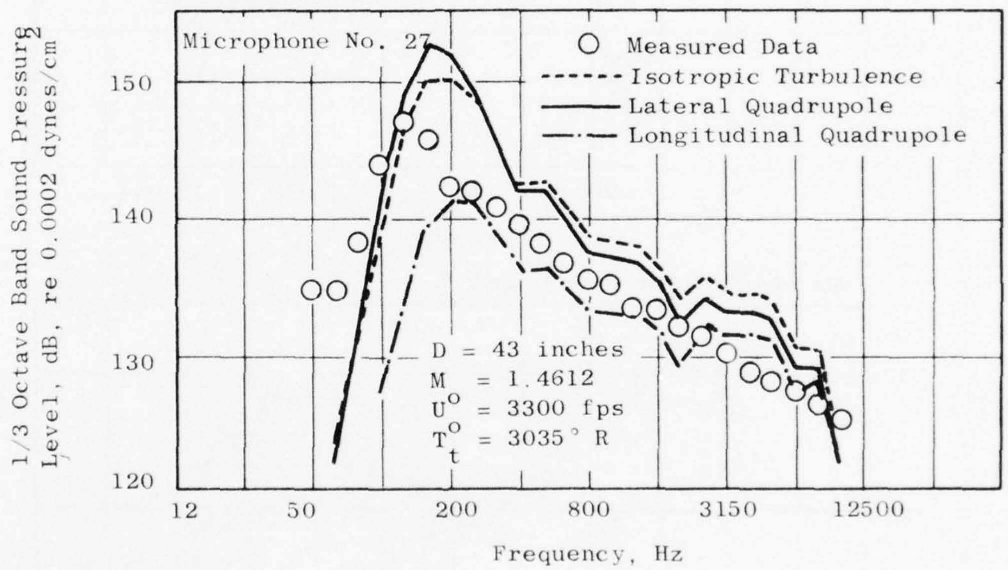


Figure 298. Near-Field Sound Pressure Spectra at Various Microphone Locations (An Initial Turbulence Level, $u'/U_o = 0.15$, Was Assumed for the Calculations), Microphones 1-4 and 27.

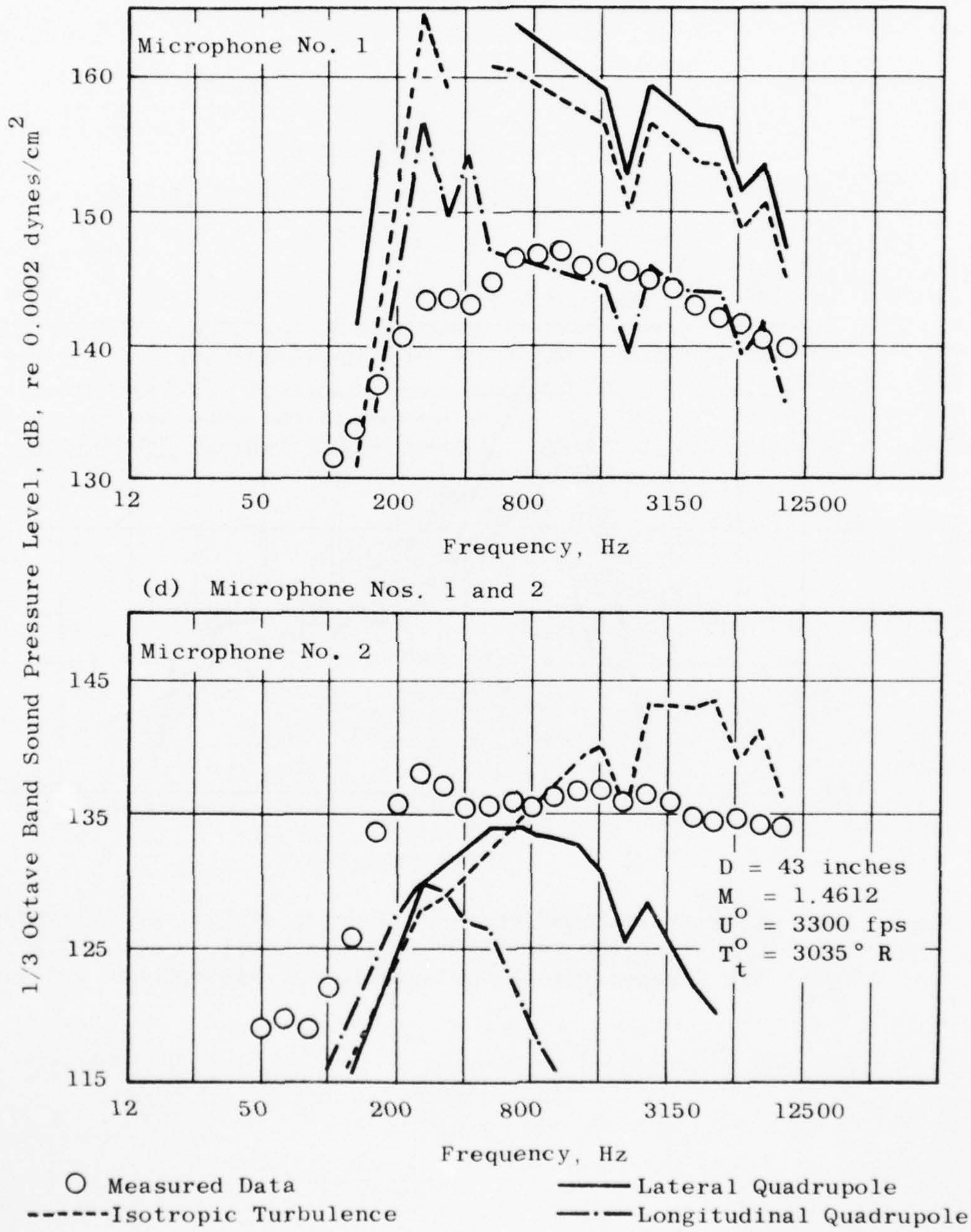


Figure 298. Near-Field Sound Pressure Spectra at Various Microphone Locations (An Initial Turbulence Level, $u'/U_o = 0.15$, Was Assumed for the Calculations), Microphones 1-4 and 27 (Continued).

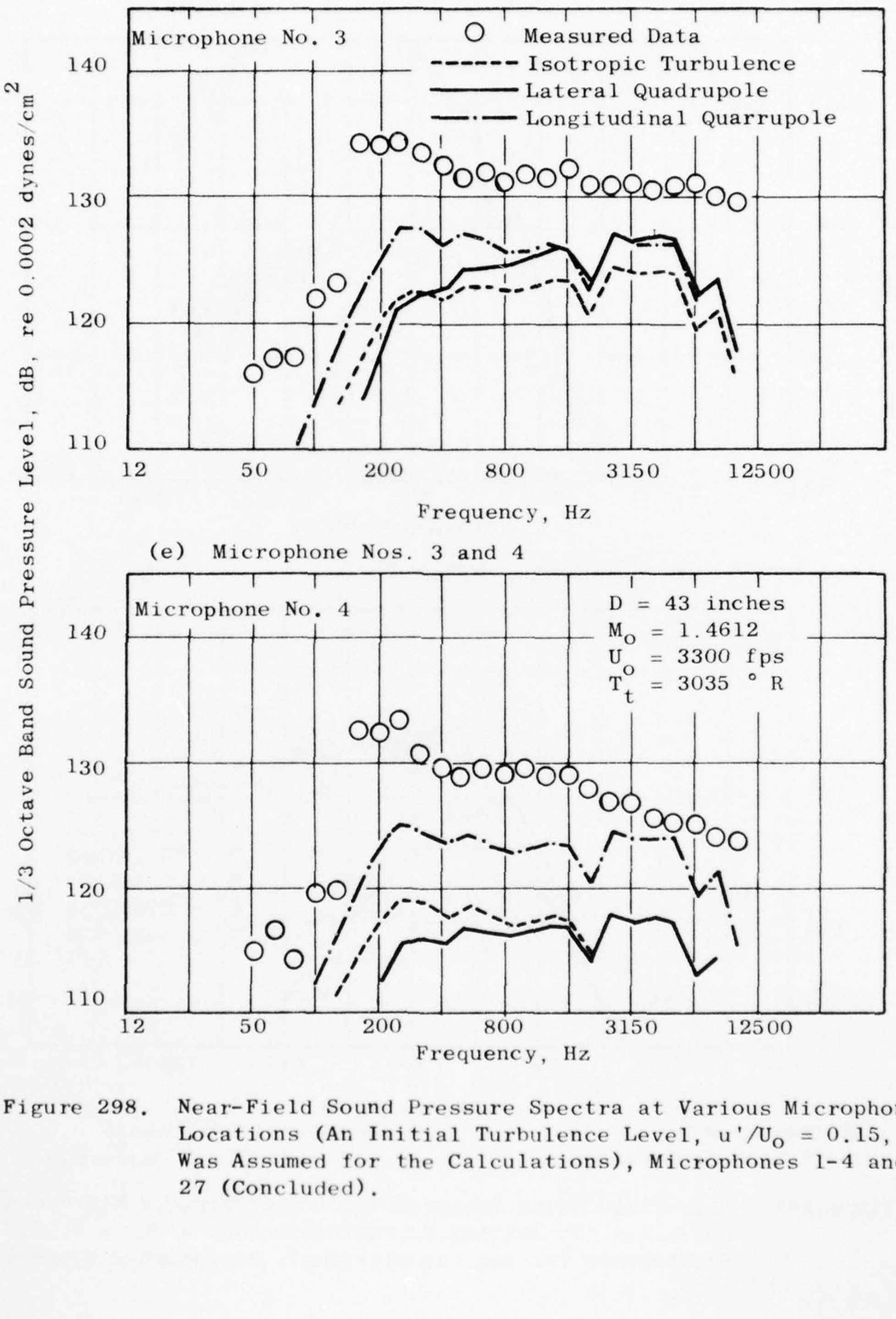


Figure 298. Near-Field Sound Pressure Spectra at Various Microphone Locations (An Initial Turbulence Level, $u'/U_o = 0.15$, Was Assumed for the Calculations), Microphones 1-4 and 27 (Concluded).

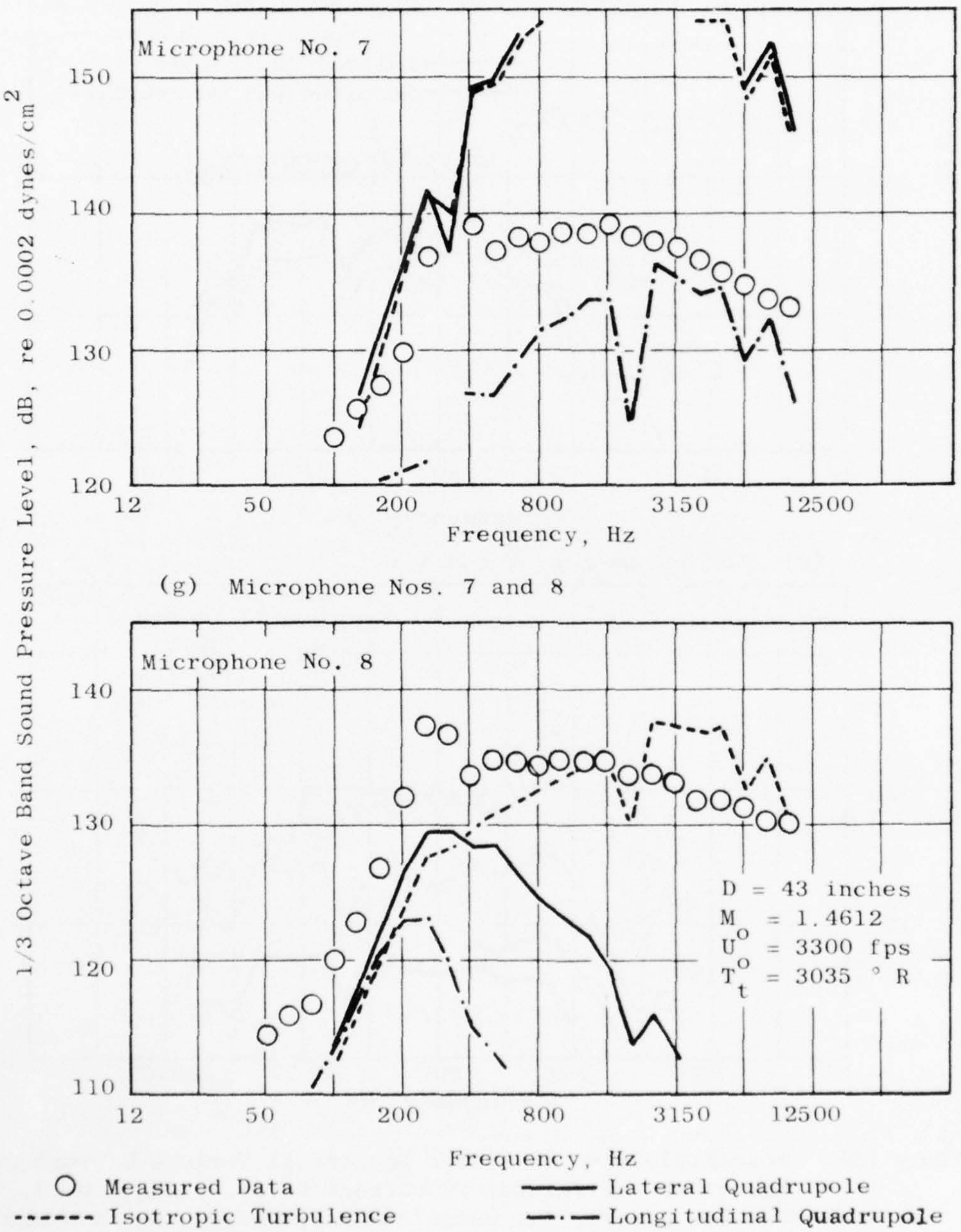


Figure 299. Near-Field Sound Pressure Spectra at Various Microphone Locations (An Initial Turbulence Level, $u'/U_o = 0.15$, Was Assumed for the Calculations), Microphones 7 and 8.

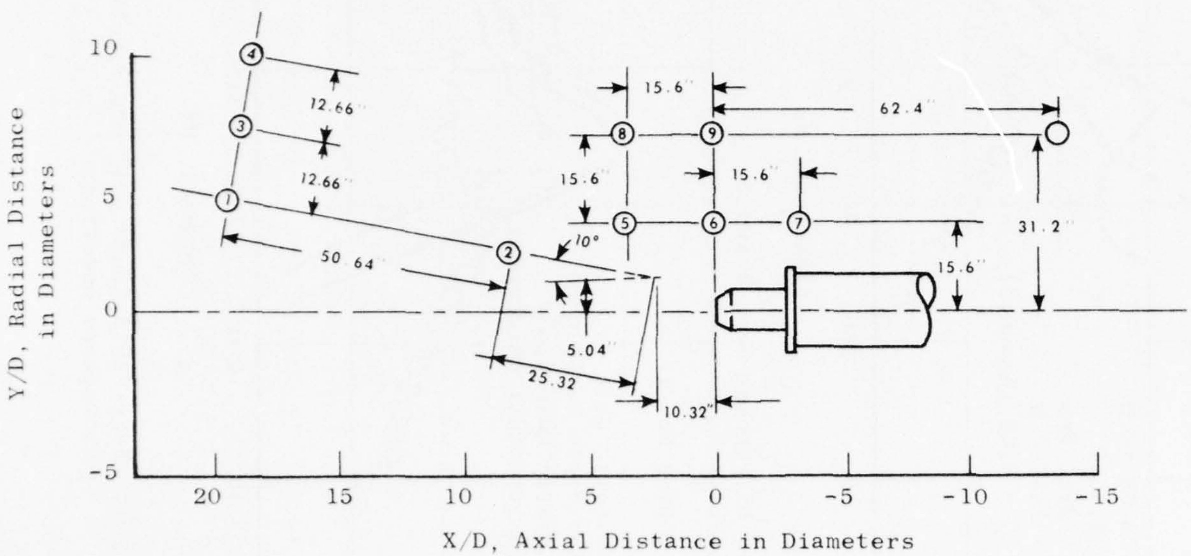


Figure 300. Near-Field Microphone Locations for a Scale Model Jet (D = 4.55 inches).

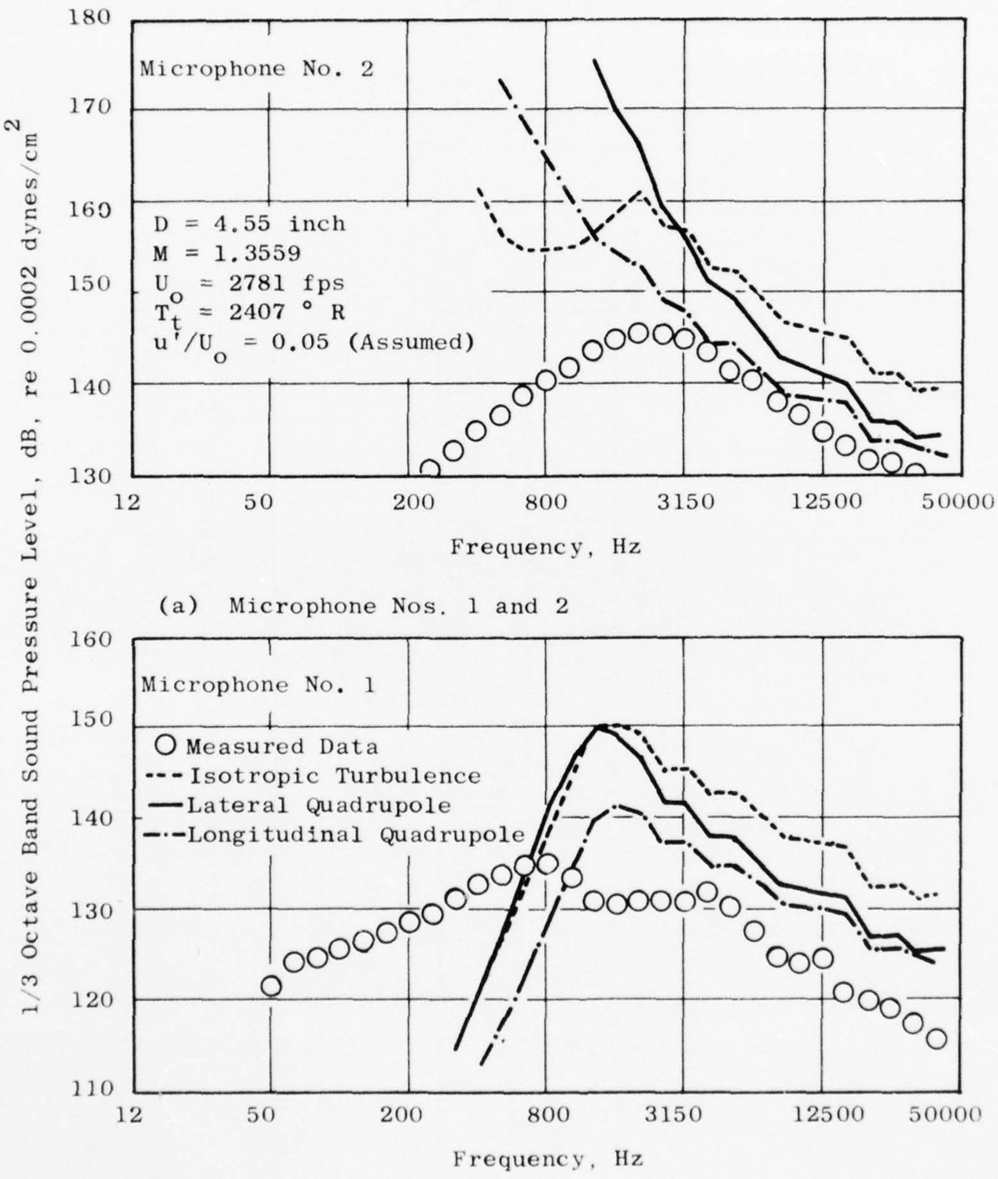
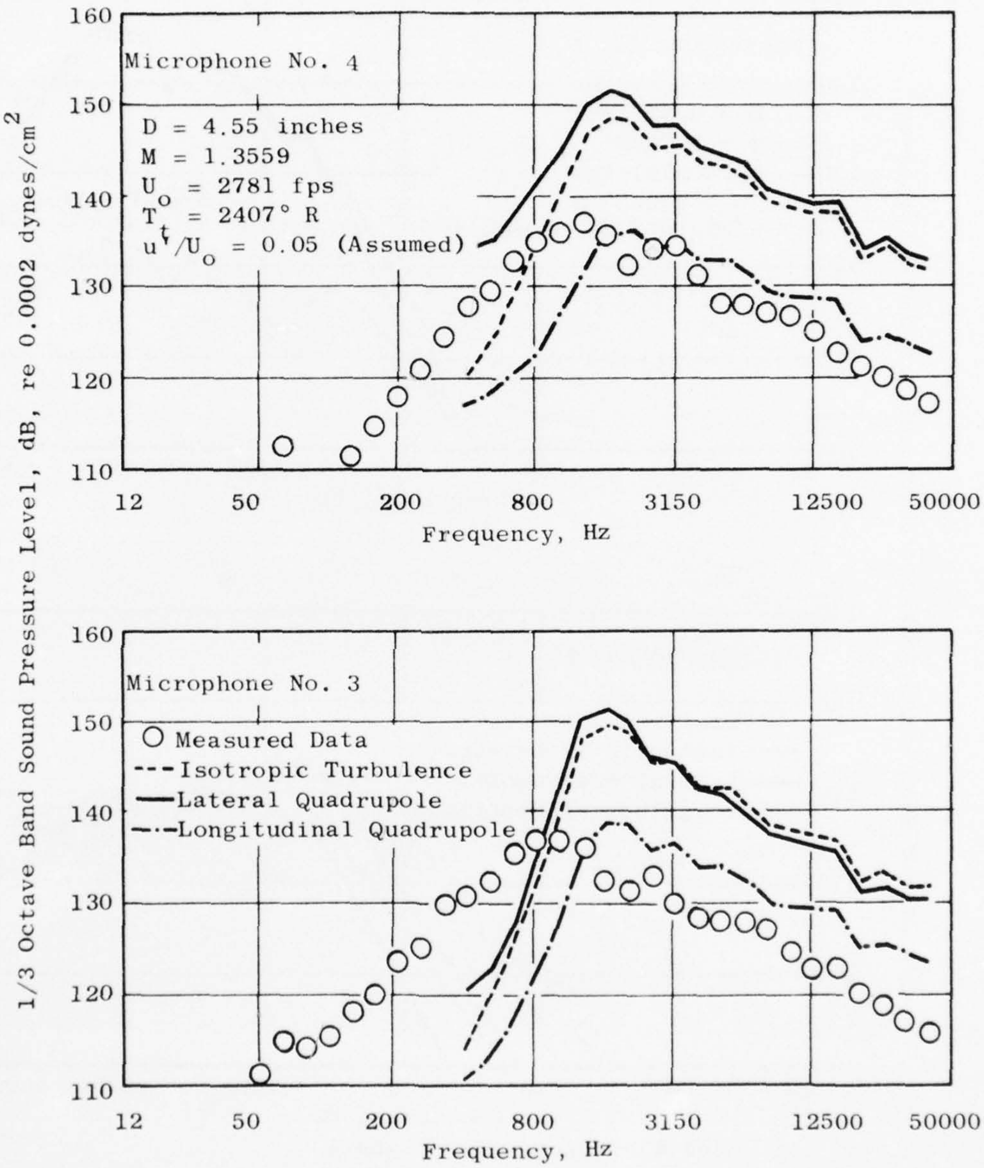
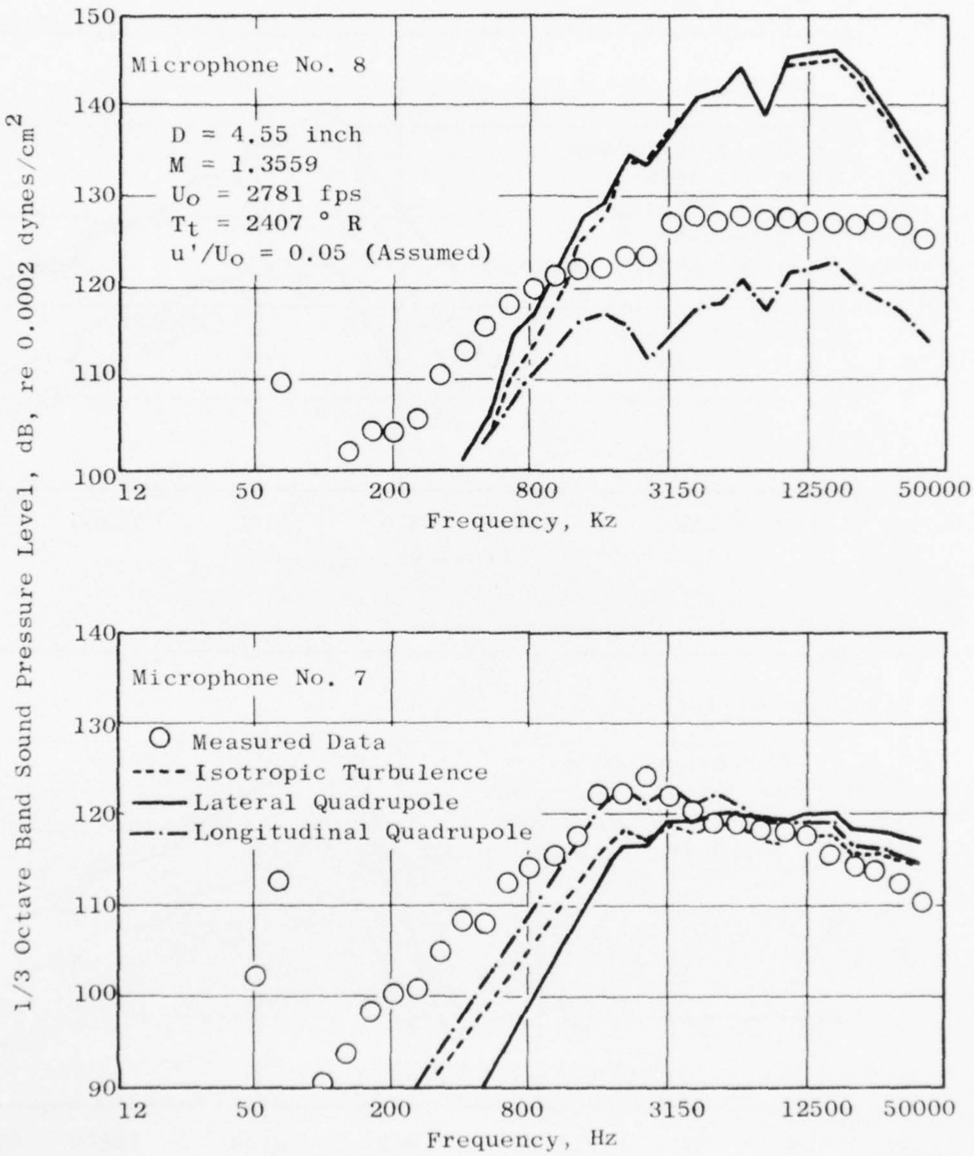


Figure 301. Near-Field Sound Pressure Spectra at Various Microphone Locations.



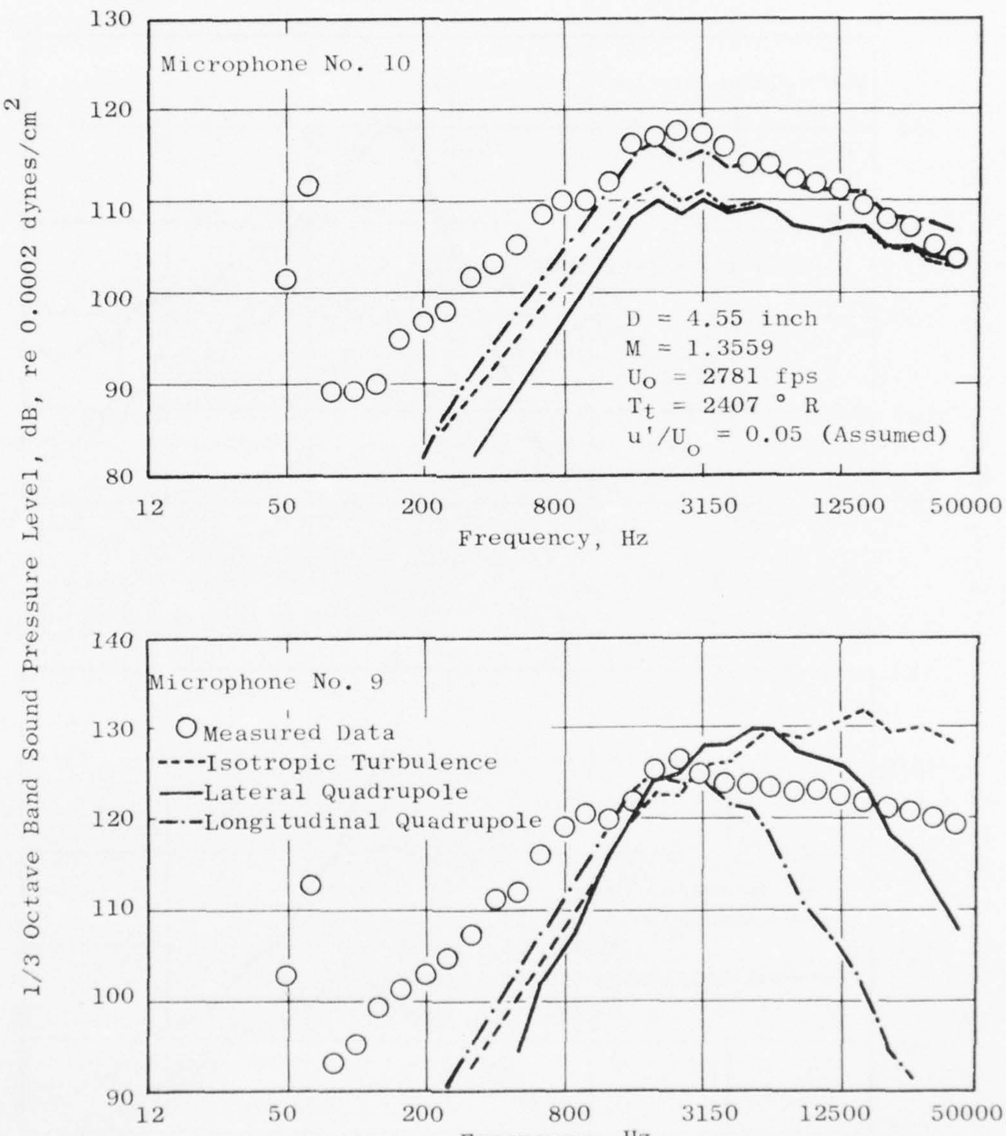
(b) Microphones No. 3 and 4

Figure 301. Near-Field Sound Pressure Spectra at Various Microphone Locations (Continued).



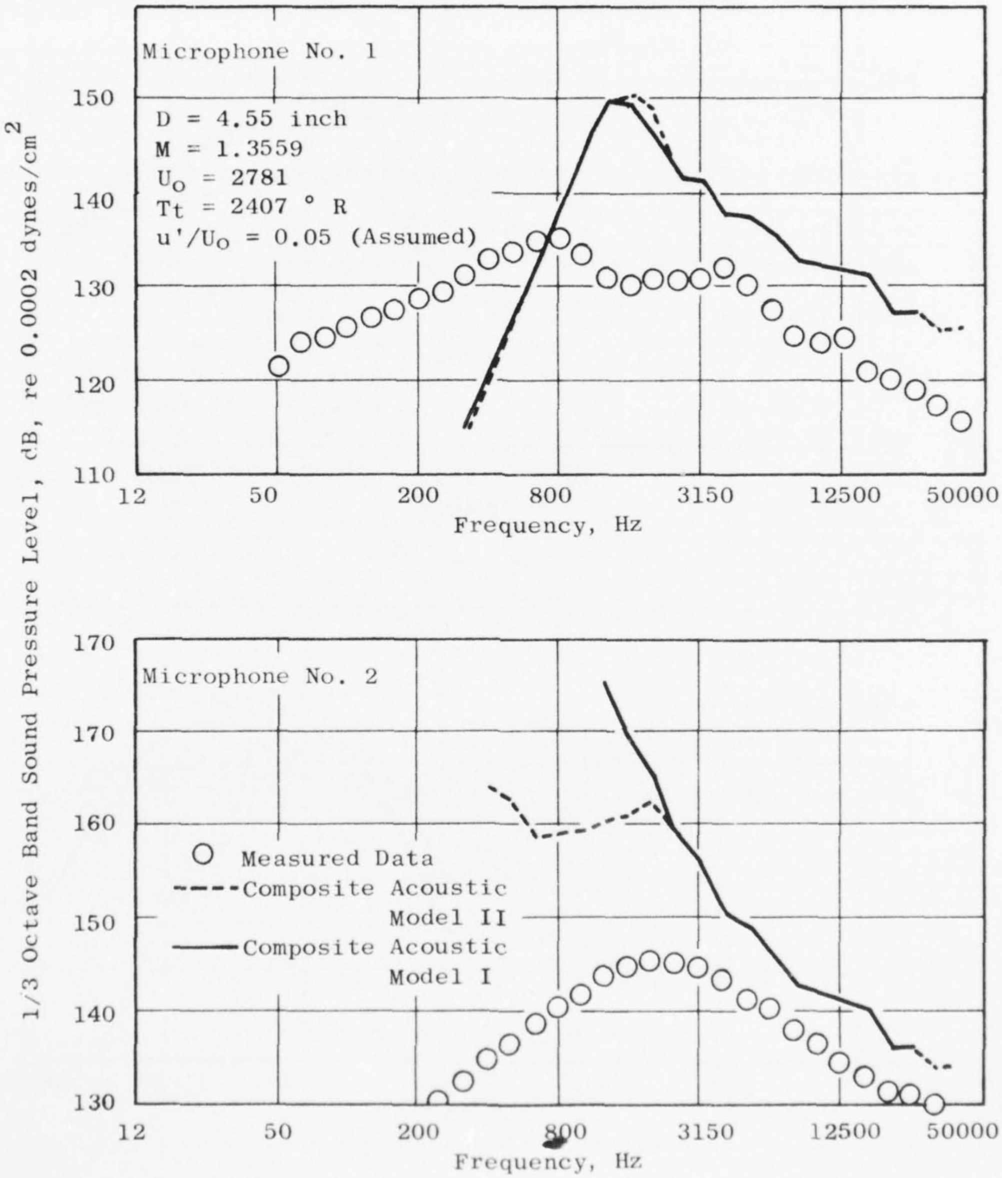
(d) Microphones No. 7 and 8

Figure 301. Near-Field Sound Pressure Spectra at Various Microphone Locations (Continued).



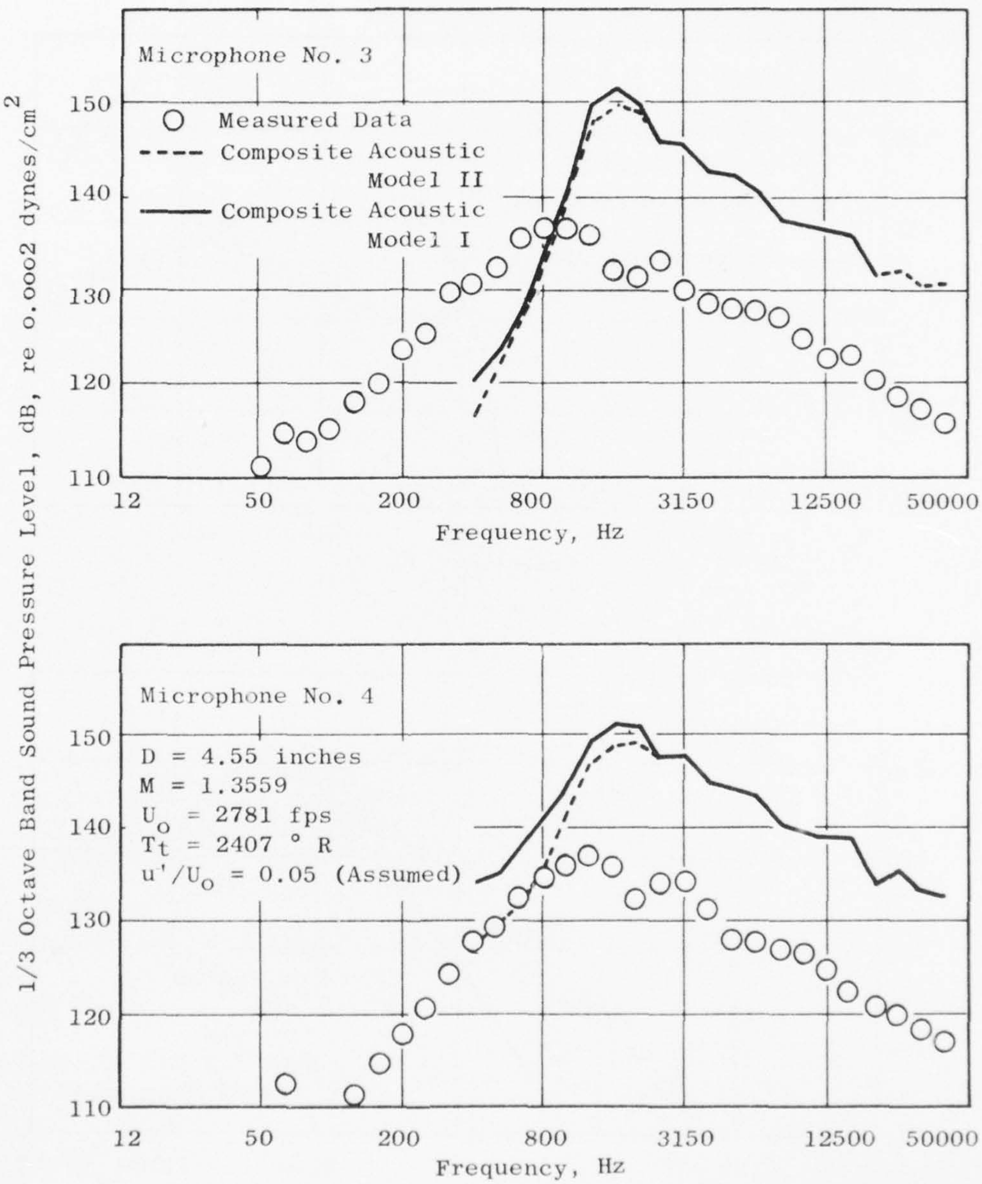
(e) Microphones No. 9 and 10

Figure 301. Near-Field Sound Pressure Spectra at Various Microphone Locations (Concluded).



(a) Microphones No. 1 and 2

Figure 302. Comparison of Measurements and Predictions by Composite Acoustic Models.



(b) Microphones No. 3 and 4

Figure 302. Comparison of Measurements and Predictions by Composite Acoustic Models (Continued).

AD-A038 614 GENERAL ELECTRIC CO CINCINNATI OHIO AIRCRAFT ENGINE GROUP F/G 20/1
SUPERSONIC JET EXHAUST NOISE INVESTIGATION. VOLUME III. COMPUTE--ETC(U)
JUL 76 D R FERGUSON, M A SMITH, P R KNOTT F33615-73-C-2031
UNCLASSIFIED R74AEG452-VOL-3 AFAPL-TR-76-68-VOL-3 NL

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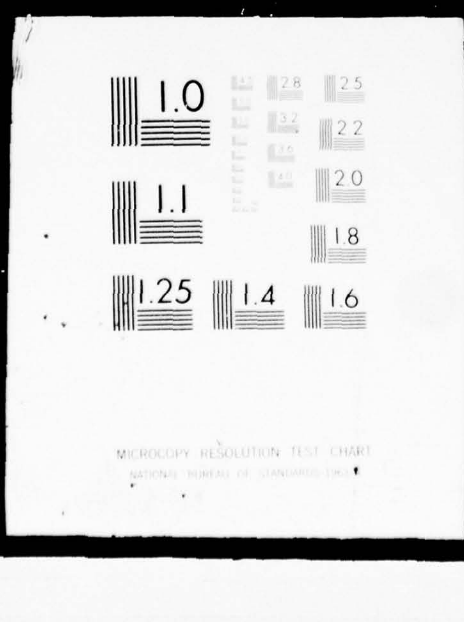
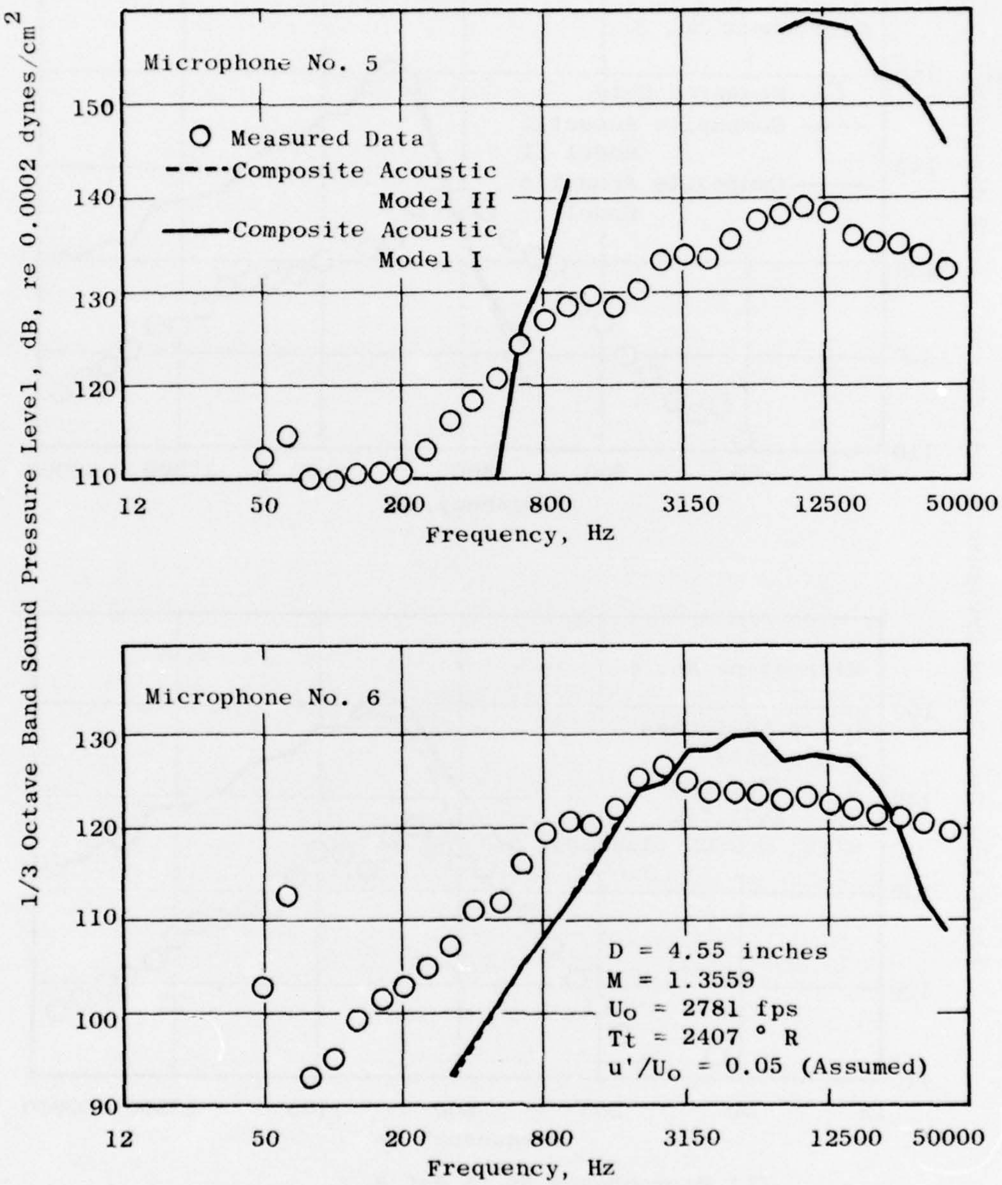
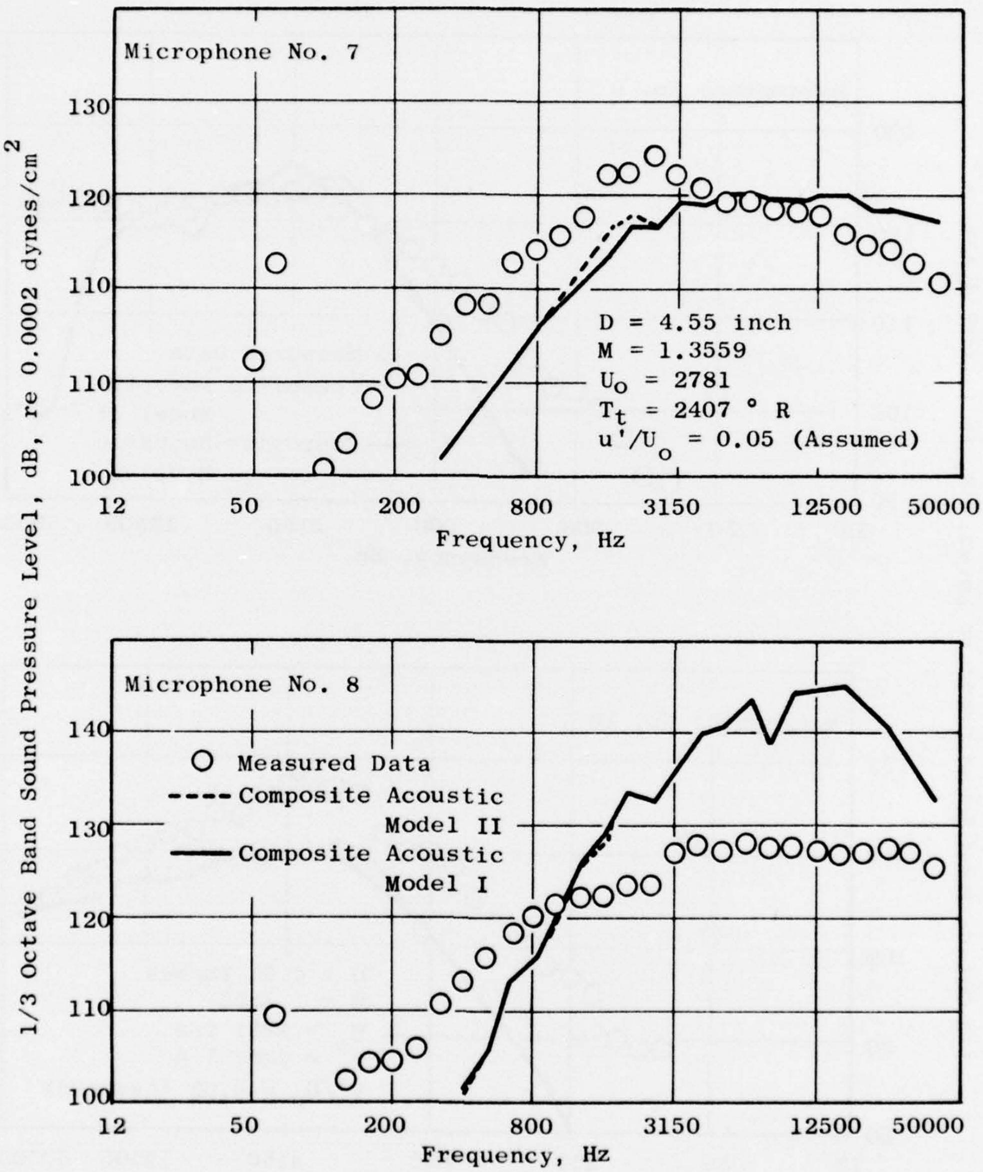




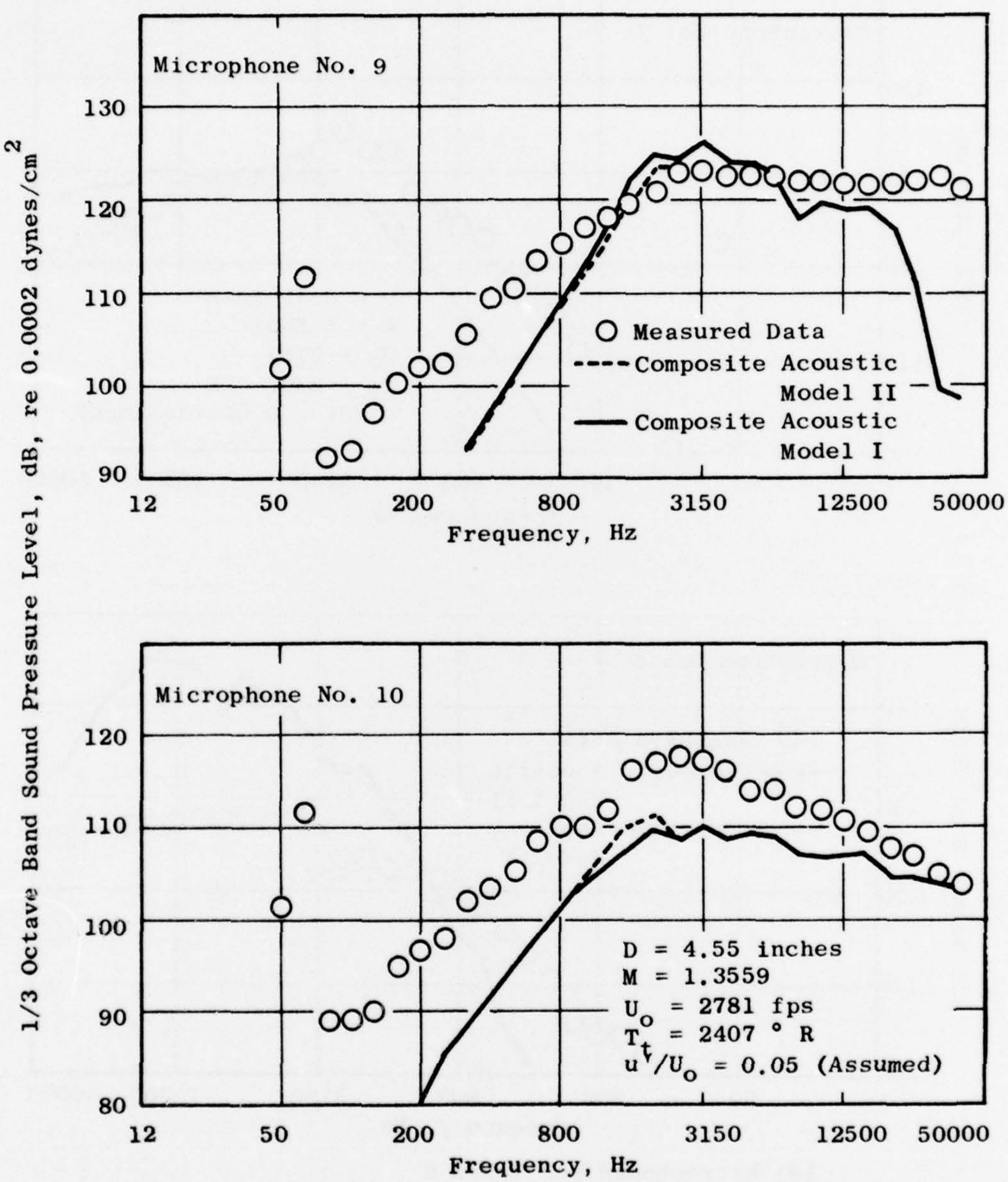
(c) Microphones No. 5 and 6

Figure 302. Comparison of Measurements and Predictions by Composite Acoustic Models (Continued).



(d) Microphones No. 7 and 8

Figure 302. Comparison of Measurements and Predictions by Composite Acoustic Models (Continued).



(e) Microphones No. 9 and 10

Figure 302. Comparison of Measurements and Predictions by Composite Acoustic Models (Concluded).

APPENDIX 9

INPUT SHEETS

JET MIXING ANALYSIS

General Flow Properties

Page___of___
CDC JET MIX
Sheet 1

▽2
NAME =
ADDRESS =
IDENT =

```
              input tape?    output tape?
                T or F          T or F
▽2                12              14
JETMIX       ____________   ____________
$ A
```

Problem Type

```
     (F) free jet           (T) axisymmetric     (F) single mixing region
      T  confined mixer      F  plane, 2-D        T  coannular or coplanar
MIX=__________________,AXI=________________,TWO=_________________________
```

Primary Jet Description

```
     diameter, in.
DIAJ=_____________,
```

-specify one line of reference quantities/specify either TJET or VJET-

```
      Mach number       turb. intensity (0.)                    velocity, fps
MJET=_____________,TIJET=__________________,TJET=___________,VJET=___________,

      total pressure, psia
PTJET=______________,TIJET=________________,TJET=___________,VJET=___________,
```

Secondary Jet Description

```
     diameter, in.
DIAO=_______________,
```

-specify one line of reference quantities/specify either TJETO or VJETO-

```
       Mach number      turb. intensity (0.)                     velocity, fps
MJETO=___________,TIJETO=______________,TJETO=_______________,VJETO=_________,

       total pressure, psia
PTJETO=______________,TIJETO=__________,TJETO=_______________,VJETO=_________,
```

External Boundary Conditions

-specify static pressure and temperature/specify either Mach number or velocity-
static pressure, psia,static temp., ° R, turb. intensity, Mach number, velocity,
fps.

```
   (14.69594)      (518.688)         (0.)
PE=____________,TE=_____________,TIE=___________,ME=_____________,VE=__________,
```

Fluid Properties and Program Controls

```
gas constant ft lbf/lbm ° R        Prandtl number       turbulent Prandtl number
       (53.34)                          (.72)                       (1.0)
RG=___________________________,PR=__________________,PRT=_______________________,
```

```
-data for Sutherland viscosity formula-(air)
SC=___________________________,TREF=________________,MUREF=_____________________,
```

```
step controls, restart station, and transition region scale interpolation
            (.02)                   (.02)                                  (T)
CXPC=___________________,CXTP=________________,RESTRT=___________,LTERP=_______,
```

NOTES:

1. Supply the 3 prefix cards for identification (user name, address, problem identification).

2. For no input tape file (01) or output tape (disc) file (02), set columns 12 and 14 of the JETMIX card to F. For either an input or an output file set the proper column to T.

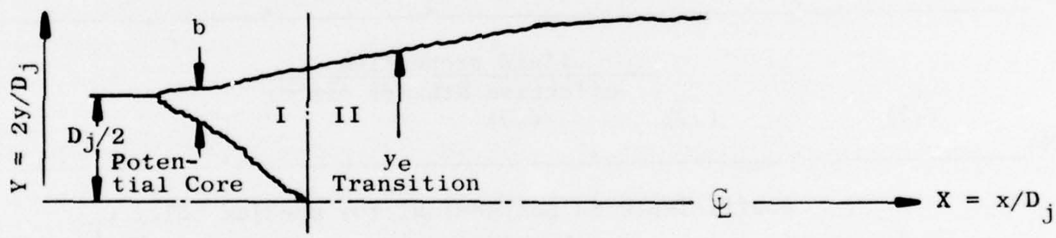
3. Parenthesized quantities denote initialized values.

4. The confined mixer option (MIX = T) is restricted to a single mixing region (TWO = F).

5. For imcompressible cases, input MJET = 0.

6. For free-jet cases, the static pressure PE is constant. For confined-mixing cases, PE denotes the static pressure at the discharge plane of the jet. The preceding remarks also apply to TE, TIE, ME, and VE.

7. The step-size controls CXPC and CXTP apply to the potential core and transition regions of the jet, respectively.



In region I, ΔX = CXPC*b, where b = width of mixing zone.
In region II, ΔX = CXTP*y_e.

8. The isentropic exponent is computed as a function of temperature using the following empirical relation:

$$\gamma = 2.23708T^{(-.070271)} \qquad 800 \leq T \leq 3600$$
$$\gamma = 1.4 \qquad T < 800$$
$$\gamma = 1.254 \qquad T > 3600$$

9. RESTRT may be used to restart a mixing problem at a given X or XD station. The value of RESTRT must appear in the X or XD table, and profiles must be stored on tape at the RESTRT station. For continuation of confined-mixing problems using the free-mixing option (MIX = F), input the normalized restart station (XD/DIAJ).

10. LTERP determines the variation of turbulence scale in the transition region.
LTERP = T -- linear variation to fully developed region.
LTERP = F -- exponential variation to fully developed region.

JET MIXING ANALYSIS

Species Diffusion Input

T -- Species diffusion
(F) - No diffusion

no. of constituents (3)

2

DIFF=________________, NC=________________,

(AIR) (CO2) (H2O)

CNAME=________________,__________,__________,__________,__________,__________,

jet stream mole fractions/external boundary conditions

primary jet

ALJ=______________,____________,__________,__________,__________,__________,

secondary jet

ALJO=______________,____________,__________,__________,__________,__________,

external boundary conditions

ALE=______________,____________,__________,__________,__________,__________,

fluid properties

effective Schmidt number

(.7) (.7) (.7)

SCM=______________,____________,__________,__________,__________,__________,

coefficients in polynominal for species molar C_p

	a	b	c	a	b	c
CPC(1)=	____________,	____________,	____________,	____________,	__________,	__________,
CPC(7)=	____________,	____________,	____________,	____________,	__________,	__________,
CPC(13)=	____________,	____________,	____________,	____________,	__________,	__________,

1. The program is initialized to consider AIR, CO2, and H20 as constituents 1, 2, and 3, respectively. These settings may be overridden by using the CNAME input. In this instance, the coefficients for the molar C_p of each constituent must be specified. Note that this option may not be used if the NAMELIST input routine does not read hollerith data.

2. Heat capacities are specified as a quadratic function of absolute temperature:

$$C_p = a + bT + cT^2$$

Btu/lb mole ° R
cal./gm mole ° K

JET MIXING ANALYSIS Page____of____

CDC JETMIX

Station Input Data Form Sheet 2

Free-Jet Mixing

2

X XPRN

B(1)=__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

__________,__________,

Confined-Jet Mixing

2

XD RD YCB XPRN

B(1)=__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

__________,__________,__________,__________,

NOTES:

1. For free-jet cases, the required input consists of the dimensionless axial stations (X = X, in./DIAJ, in.) at which a print of the jet properties is desired.

2. The coordinates for the confined-mixing case (XD, RD, YCB) are input in dimensional form. Select suitable intervals in XD to adequately describe the intended curve. If bits = 1_0 E+15 (junk word) appears in the lists of RD and YCB, the missing values will be supplied by linear interpolation against the independent variable XD or (if no subsequent data are given) the last value in the list is extended down the column.

3. Specify XPRN(1)=1 at those stations for which tabular printout of the jet mixing profiles is desired. If profiles are to be printed at all stations, specify XPRN(1)=2 only at the first station. Also, if profiles at a given station are to be saved on file (2), but not printed, set XPRN(1)=1. To save all profiles, set XPRN(1)=-2.

4. The centerbody coordinate is assumed 0 if the YCB column is left blank.

5. If desired, these data lists may be input in "Free form" under their symbolic names X, XD, RD, YCB, and XPRN using FORTRAN IV Namelist conventions. If data are specified in both the B-block and in the Free form, the B-block data will take precedence.

6. The maximum number of X or XD stations is 100.

7. If no station input are provided, the program will use a set of X's, XPRN's which have been optimized for acoustic cases.

FLOW FIELD ANALYSIS
SUPERSONIC TURBULENT JETS
FILE MERGE

Page___ of___
(CDC) SSFD MERGE
SSFD/MERGE Sheet 1 of 1

---

output tape?
T or F

2 12 14
SSFD T __________
$INPUT

Problem Description

(T) axisymmetric
F 2-D
AXISYM=________________,

initial Mach No.
(1.05)
XMACH=________________,

Specific heat ratios
(1.4) (1.4)
GAMMA(1)=________,________,

Program Controls

final X/D_J
XL=________________,

stability parameter
(.5)
STABIL=________________,

(1) print profiles & shock pattern
0-no print
IPRINT=________________,

SSFD Total Pressure Input Stations

no. of stations
(20)
NPT=________________,

X/D_J from JETMIX Tables (see NOTES)
XPT(1)=________,________,________,________,________,
________,________,________,________,________,
________,________,________,________,________,
________,________,________,________,________,

MERGE

---

2 12 14
MERGE T T

NOTES:

1. SSFD always requires a JETMIX input file for execution. If SSFD is being run alone, using an input tape saved from a previous JETMIX run, supply the 3 prefix identification cards (see JETMIX input sheets). If an output file is to be generated (file 3), set column 14 to T.

2. If GAMMA is input, two equal values must be supplied.

3. Parenthesized quantities denote initialized values. The only item which may normally require revision is STABIL. This input controls the step size used in the finite difference solution. If XL is not input, the final station will be taken as the JETMIX X/D where the potential core disappears.

4. SSFD uses total pressure data from the JETMIX solution at the stations XPT. These stations are initialized to: XPT(1)=0, .1, .2, .3, .4, .5, .7, 1., 2., 2.5, 3., 4., 5., 6.2, 7.5, 9., 11., 13., 15., 20.,

5. The MERGE program is used to collate data from JETMIX and SSFD for input to the NOISE program. Include the MERGE T T card if the collated data are to be saved for a NOISE run (file 4). No namelist input are required.

2 12 14
NOISE T F
$A

General Input

(2) JETMIX input file
4 MERGE input file

MFILE=____________,

source-receiver frequency shift (.5)	jet diameter scaling factor (1.)	ref. pressure (.0002)
SCALT=____________,	SCALJ=________________,	PREFN=____________

(F)
T - 1/3-octave band analysis

BAND3=____________,

(0) fixed convected Mach No. 1 variable convected Mach No.	convected Mach No. constant (.63)
MC=________________,	CVMACH=________________,

(F) T Input ?	acoustic intensity proportionality constant .00425 cold jet .002125 hot jet
BETAIN=____________,	BETA=____________,

(0) cold jet 1 hot jet	(F) $q = (1.1\ u')/a_o$ T $q = \alpha M$
JETTEM=____________,	QCONV=____________,

Acoustic Models-Far Field

(0) Lighthill self-noise model 1 Empirical self- + shear-noise	(F) T Lilley's model
LIGHTH=____________	LILLEY=____________,

(F) T Ribner's model	0 - self-noise only (.2577)	0 - shear-noise only (1.0)
RIBNER=________________,	CRIB=____________,	SE=________________,

(F) T Pao's model	(F) Pao Press. T spectrum model	(0) self- + shear-noise 1 self-noise only 2 shear-noise only
PAO=________________,	PSPEC=________________,	MU=________________,

Acoustic Model-Near Field

NEARFD=____________,

1 - Isotropic turbulence model
2 - Lateral Quadrupole model
3 - Longitudinal Quadrupole model
4 - Combination model using Lateral Quadrupole model in transition region
5 - Combination model using Longitudinal Quadrupole model in transition region

X/D where potential core disappears

XCORE=______________,

NOTES:

1. If NOISE is being run alone, using an input tape from JETMIX or MERGE, supply the 3 identification prefix cards (see JETMIX input sheets).

2. Parenthesized quantities denote initialized values. These items need not be input unless different from preset values.

3. MFILE denotes the input file code for the aerodynamic data. Set MFILE = 4 if aero input is from the MERGE program.

4. The proportionality constant BETA may be determined from experimental data. If input, set BETAIN = T and supply the empirically determined constant.

5. If no acoustic model is selected, the Lighthill far-field model will be used. Only one model may be selected per case.

JET NOISE PREDICTION

Page___of___
NOISE/Sheet 2

Microphone Geometry Configuration

2 no. of input angles

NA=________________,

angle from jet exhaust axis, degrees

ANGJ(1)=_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

(F) sideline configuration
T arc configuration

ARC=__________________,

specify either sideline distance or arc radius, ft

SLINE=__________________, ARCL=________________,

Output Control

specify T for profile printout at a given angle (ANGJ)

ACSPAN(1)=_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

specify T for X station (JETMIX) full acoustic printout

ACØUSP(1)=_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

_____,_____,_____,_____,_____,_____,_____,_____,_____,_____,

NOTES:

1. Acoustic calculations may be performed at a maximum of 20 angles (ANGJ, degrees).

2. Specify the microphone configuration as either a sideline or an arc. Also, specify the sideline distance or the arc radius in feet.

3. The normal program output consists of a summary of the ØASPL, SPL, PWL, etc. at the axial stations of the jet for each angle. This output may be augmented by 1/3-octave-band PWL's. If detailed output is desired, ACSPAN and ACØUSP may be used. Detailed profile printout will be obtained when ACSPAN(I)=T and any of the ACØUSP(J)'s are true.

APPENDIX 10

SAMPLE CASES

```
* * C A R D   I N P U T * *

NAME=    DAVE FERGUSON
ADDRESS= EVENDALE (GE)
IDENT=   USER MANUAL TEST CASE
JETMIX    F T
$A
DIAJ=4.3,MJET=1.559,TJET=518.7,TTJET=.1,
PE=14.696,TE=518.7,ME=0.,TIE=0.,
CXTP=.04,
$
SSFD      T T
$INPUT
XMACH=1.05,STARIL=.6,XL=1.7,
$
MERGE     T T
NOISE     T F
$A
LIGHTH=1,BAND3=T,QCONV=T,
ARC=T,ARCL=40.,
NA=5,ANGJ(1)=10.,20.,30.,150.,160.,
$
NOISE     T F
$A
MFILE=4,
LIGHTH=1,BAND3=T,QCONV=T,
ARC=T,ARCL=40.,
NA=5,ANGJ(1)=10.,20.,30.,150.,160.,
$
```

```
EXECUTING PROGM=JETMIX
TAPIN= F      TAPOT= T
```

* FREE JET PROGRAM *

* AXISYMMETRIC * * ISOTHERMAL * * COMPRESSIBLE * JET

** SINGLE MIXING REGION **

NAME= DAVE FERGUSON
ADDRESS= EVENDALE (GE)
IDENT= USER MANUAL TEST CASE

* INPUT AND INITIAL CONDITIONS *

EXTERNAL CONDITIONS		JET DISCHARGE PARAMETERS		GAS PROPERTIES	
TE =	518.700	DIAJ =	4.30000	GAM =	1.40000
PE =	1.4696E+01	MJET =	1.5590	RG =	53.34000
VE =	.000	TJET =	518.700	PR =	.72000
ME =	.0000	PTJET=	5.8798E+01	PRT =	1.00000
TIE=	.0	VJET =	1740.393	SC =	**00000000.000
		TIJET=	1.0000E-01	TREF =	**00000000.000
		FLOWJ=	1.0686E+00	MUREF=	1.0000E+15

* INITIAL PROFILES *

N	Y	PSI	U	THETA	TI
1	.0	.0	1.00000000	1.00000000	1.0000000E-01
2	3.4483E-02	2.2737E-05	1.00000000	1.00000000	1.0000000E-01
3	6.8966E-02	9.0949E-05	1.00000000	1.00000000	1.0000000E-01
4	1.0345E-01	2.0463E-04	1.00000000	1.00000000	1.0000000E-01
5	1.3793E-01	3.6379E-04	1.00000000	1.00000000	1.0000000E-01
6	1.7241E-01	5.6843E-04	1.00000000	1.00000000	1.0000000E-01
7	2.0690E-01	8.1854E-04	1.00000000	1.00000000	1.0000000E-01
8	2.4138E-01	1.1141E-03	1.00000000	1.00000000	1.0000000E-01
9	2.7586E-01	1.4552E-03	1.00000000	1.00000000	1.0000000E-01
10	3.1034E-01	1.8417E-03	1.00000000	1.00000000	1.0000000E-01
11	3.4483E-01	2.2737E-03	1.00000000	1.00000000	1.0000000E-01
12	3.7931E-01	2.7512E-03	1.00000000	1.00000000	1.0000000E-01
13	4.1379E-01	3.2742E-03	1.00000000	1.00000000	1.0000000E-01
14	4.4828E-01	3.8426E-03	1.00000000	1.00000000	1.0000000E-01
15	4.8276E-01	4.4565E-03	1.00000000	1.00000000	1.0000000E-01
16	5.1724E-01	5.1159E-03	1.00000000	1.00000000	1.0000000E-01
17	5.5172E-01	5.8207E-03	1.00000000	1.00000000	1.0000000E-01
18	5.8621E-01	6.5710E-03	1.00000000	1.00000000	1.0000000E-01
19	6.2069E-01	7.3668E-03	1.00000000	1.00000000	1.0000000E-01
20	6.5517E-01	8.2081E-03	1.00000000	1.00000000	1.0000000E-01
21	6.8966E-01	9.0949E-03	1.00000000	1.00000000	1.0000000E-01
22	7.2414E-01	1.0027E-02	1.00000000	1.00000000	1.0000000E-01
23	7.5862E-01	1.1005E-02	1.00000000	1.00000000	1.0000000E-01
24	7.9310E-01	1.2028E-02	1.00000000	1.00000000	1.0000000E-01
25	8.2759E-01	1.3097E-02	1.00000000	1.00000000	1.0000000E-01

26	8.6207E-01	1.4211E-02	1.00000000	1.00000000	1.0000000E-01
27	8.9655E-01	1.5370E-02	1.00000000	1.00000000	1.0000000E-01
28	9.3103E-01	1.6575E-02	1.00000000	1.00000000	1.0000000E-01
29	9.6552E-01	1.7826E-02	1.00000000	1.00000000	1.0000000E-01
30	9.8276E-01	1.8387E-02	.75000000	1.00000000	8.6602540E-02
31	1.0000E+00	1.8795E-02	.50000000	1.00000000	7.0710678E-02
32	1.0172E+00	1.9044E-02	.25000000	1.00000000	5.0000000E-02
33	1.0345E+00	1.9128E-02	.00000000	1.00000000	.0

* JET ANALYSIS PROGRAM *

PROFILES-- STA (12) X= .01000 PRESSURE= 14.6960

		*			** DIMENSIONLESS **			**		** DIMENSIONAL **		*
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	.00000	.0	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
24	.79310	1.2028E-02	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
25	.82759	1.3097E-02	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
26	.86207	1.4211E-02	1.000000	1.000000	9.84225E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
27	.89655	1.5370E-02	1.000000	1.000000	9.84226E-02	.9988860	1.0000000	1.55900	1740.3929	518.7000	778.1129	58.7981
28	.93104	1.6575E-02	.999969	1.000000	9.84372E-02	.9988349	.9999065	1.55895	1740.3395	518.7000	778.0997	58.7940
29	.96562	1.7826E-02	.994024	1.000000	1.02984E-01	.9899949	.9819011	1.54968	1729.9927	518.7000	775.8039	57.9999
30	.98322	1.8387E-02	.751346	1.000000	9.65849E-02	.5751328	.4453897	1.17135	1307.6372	518.7000	668.0633	34.3386
31	1.00108	1.8795E-02	.501986	1.000000	8.81191E-02	.2672127	.1660948	.78260	873.6528	518.7000	588.0957	22.0211
32	1.01840	1.9044E-02	.295245	1.000000	1.38544E-01	.1405085	.0520925	.46029	513.8426	518.7000	555.1904	16.9934
33	1.04604	1.9128E-02	.044176	1.000000	3.52918E-02	.0055213	.0011077	.06887	76.8841	518.7000	520.1339	14.7449
34	5.56184	1.9211E-02	.000074	1.000000	1.15341E-03	.0000039	.0000000	.00011	.1281	518.7000	518.7010	14.6960
35	3307.54488	1.9295E-02	.000000	1.000000	2.27580E-06	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960
36	*2550.94203	1.9379E-02	.000000	1.000000	3.66615E-09	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960
37	*7085.37485	1.9463E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (15) X= .02000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
1	.00000	.0	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
24	.79310	1.2028E-02	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
25	.82759	1.3097E-02	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
26	.86207	1.4211E-02	1.000000	1.000000	9.67641E-02	.9979434	1.0000000	1.55900	1740.3929	518.7000	777.8681	58.7981
27	.89655	1.5370E-02	1.000000	1.000000	9.67643E-02	.9979435	1.0000000	1.55900	1740.3929	518.7000	777.8682	58.7981
28	.93104	1.6575E-02	.999888	1.000000	9.68145E-02	.9977548	.9996587	1.55883	1740.1982	518.7000	777.8191	58.7831
29	.96572	1.7826E-02	.988402	1.000000	1.05114E-01	.9804665	.9651307	1.54092	1720.2074	518.7000	773.3293	57.2603
30	.98336	1.8387E-02	.751441	1.000000	1.04681E-01	.5800159	.4455376	1.17150	1307.8019	518.7000	669.3314	34.3451
31	1.00124	1.8795E-02	.500629	1.000000	1.02299E-01	.2737556	.1650662	.78048	871.2918	518.7000	589.7949	21.9758
32	1.01718	1.9044E-02	.339163	1.000000	1.89056E-01	.2157403	.0699015	.52876	590.2768	518.7000	574.7283	17.7768
33	1.02749	1.9128E-02	.150044	1.000000	9.93700E-02	.0506075	.0129390	.23392	261.1356	518.7000	531.8429	15.2666
34	1.27635	1.9211E-02	.003924	1.000000	1.25546E-02	.0004739	.0000087	.00612	6.8289	518.7000	518.8231	14.6964
35	98.07887	1.9295E-02	.000000	1.000000	9.81097E-05	.0000000	.0000000	.00000	.0004	518.7000	518.7000	14.6960
36	78258.70920	1.9379E-02	.000000	1.000000	2.45348E-07	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960
37	*0674.08446	1.9463E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (16) X= .04000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
1	.00000	.0	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
20	.65517	8.2091E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
24	.79310	1.2028E-02	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
25	.82759	1.3097E-02	1.000000	1.000000	9.41445E-02	.9964870	1.0000000	1.55900	1740.3929	518.7000	777.4899	58.7981
26	.86207	1.4211E-02	1.000000	1.000000	9.41445E-02	.9964871	1.0000000	1.55900	1740.3029	518.7000	777.4899	58.7981
27	.89655	1.5370E-02	.999995	1.000000	9.41464E-02	.9964783	.9999846	1.55899	1740.3841	518.7000	777.4876	58.7974
28	.93104	1.6575E-02	.999477	1.000000	9.43703E-02	.9955968	.9984059	1.55819	1739.4834	518.7000	777.2587	58.7278
29	.96598	1.7826E-02	.974172	1.000000	1.11119E-01	.9571389	.9237828	1.51873	1695.4417	518.7000	767.2711	55.4368
30	.98378	1.8387E-02	.747960	1.000000	1.24042E-01	.5878452	.4401251	1.16607	1301.7437	518.7000	671.3647	34.1064
31	1.00168	1.8795E-02	.500831	1.000000	1.30268E-01	.2928924	.1652185	.78079	871.6419	518.7000	594.7648	21.9825
32	1.01720	1.9044E-02	.354513	1.000000	1.83665E-01	.2202250	.0768604	.55269	616.9926	518.7000	575.8929	18.0857
33	1.02420	1.9128E-02	.270024	1.000000	1.71722E-01	.1566460	.0432004	.42097	469.9472	518.7000	559.3813	16.6012
34	1.03627	1.9211E-02	.131022	1.000000	1.03791E-01	.0480334	.0098344	.20426	228.0303	518.7000	531.1744	15.1297
35	1.25016	1.9295E-02	.004642	1.000000	1.72847E-02	.0008909	.0000122	.00724	8.0781	518.7000	518.9314	14.6965
36	60.94822	1.9379E-02	.000001	1.000000	2.58477E-04	.0000002	.0000000	.00000	.0010	518.7000	518.7001	14.6960
37	86.18074	1.9463E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (17) X= .06000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH	** U	** DIMENSIONAL ** T	TOT	PTOT*
1	.00000	.0	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
4	.10345	2.0461E-04	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
24	.79310	1.2028E-02	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
25	.82759	1.3097E-02	1.000000	1.000000	9.20730E-02	.9953637	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
26	.86207	1.4211E-02	1.000000	1.000000	9.20730E-02	.9953638	1.0000000	1.55900	1740.3929	518.7000	777.1982	58.7981
27	.89655	1.5370E-02	.999971	1.000000	9.20807E-02	.9953113	.9999111	1.55895	1740.3421	518.7000	777.1846	58.7942
28	.93106	1.6575E-02	.998591	1.000000	9.26767E-02	.9929546	.9957061	1.55680	1737.9402	518.7000	776.5725	58.6087
29	.96534	1.7826E-02	.956186	1.000000	1.18844E-01	.9286103	.8737002	1.49069	1664.1385	518.7000	759.8622	53.2280
30	.98437	1.8387E-02	.740222	1.000000	1.43819E-01	.5920937	.4282791	1.15401	1288.2772	518.7000	672.4681	33.5840
31	1.00217	1.8795E-02	.509187	1.000000	1.52564E-01	.3194478	.1716269	.79382	886.1845	518.7000	601.6613	22.2651
32	1.01737	1.9044E-02	.362786	1.000000	1.74072E-01	.2159926	.0807755	.56558	631.3906	518.7000	574.7938	18.2584
33	1.02391	1.9128E-02	.299802	1.000000	1.68395E-01	.1698215	.0538004	.46739	521.7729	518.7000	562.8030	17.0687
34	1.03227	1.9211E-02	.222171	1.000000	1.52095E-01	.1152762	.0288331	.34636	386.6651	518.7000	548.6375	15.9676
35	1.04797	1.9295E-02	.096177	1.000000	8.44471E-02	.0297453	.0052736	.14994	167.3852	518.7000	526.4249	14.9286
36	1.40295	1.9379E-02	.002588	1.000000	1.24947E-02	.0004611	.0000038	.00403	4.5035	518.7000	518.8198	14.6962
37	1.68472	1.9463E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (19) X= .10000 PRESSURE= 14.6960

N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
		*	** DIMENSIONLESS			**			**	** DIMENSIONAL	**	*
1	.00000	.0	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
18	.58621	6.5719E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
21	.68966	9.0249E-03	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
24	.79310	1.2028E-02	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
25	.82759	1.3097E-02	1.000000	1.000000	8.83706E-02	.9934183	1.0000000	1.55900	1740.3929	518.7000	776.6930	58.7981
26	.86207	1.4211E-02	1.000000	1.000000	8.83713E-02	.9934187	1.0000000	1.55900	1740.3929	518.7000	776.6931	58.7981
27	.89655	1.5370E-02	.999829	1.000000	8.84134E-02	.9931091	.9994792	1.55873	1740.0959	518.7000	776.6127	58.7751
28	.93112	1.6575E-02	.995381	1.000000	9.03619E-02	.9855085	.9859856	1.55180	1732.3542	518.7000	774.6388	58.1800
29	.96719	1.7826E-02	.918121	1.000000	1.33272E-01	.8699505	.7752855	1.43135	1597.8916	518.7000	744.6281	48.8877
30	.98576	1.8387E-02	.723282	1.000000	1.68254E-01	.5902353	.4032152	1.12760	1258.7948	518.7000	671.9854	32.4786
31	1.00325	1.8795E-02	.531675	1.000000	1.75837E-01	.3644259	.1897088	.82888	925.3240	518.7000	613.3422	23.0626
32	1.01740	1.9044E-02	.397802	1.000000	1.72772E-01	.2405314	.0986762	.62017	692.3321	518.7000	581.1665	19.0678
33	1.02320	1.9128E-02	.346525	1.000000	1.67097E-01	.1978668	.0731899	.54023	603.0895	518.7000	570.0864	17.9238
34	1.02796	1.9211E-02	.290619	1.000000	1.57880E-01	.1545686	.0503908	.45308	505.7919	518.7000	558.8418	16.9183
35	1.03828	1.9295E-02	.227036	1.000000	1.42498E-01	.1091644	.0301495	.35395	395.1322	518.7000	547.0502	16.0257
36	1.05015	1.9379E-02	.144849	1.000000	1.09227E-01	.0551083	.0120472	.22582	252.0933	518.7000	533.0117	15.2273
37	1.11084	1.9463E-02	.018895	1.000000	2.95076E-02	.0028821	.0002025	.02946	32.8850	518.7000	519.4485	14.7049
38	8.93093	1.9547E-02	.000028	1.000000	1.10466E-03	.0000036	.0000000	.00004	.0487	518.7000	518.7009	14.6960
39	12.58130	1.9631E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (21) X= .20000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
		** DIMENSIONLESS					**		** DIMENSIONAL			**
1	.00000	.0	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
24	.79310	1.2028E-02	1.000000	1.000000	8.16545E-02	.9900930	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
25	.82759	1.3097E-02	1.000000	1.000000	8.16550E-02	.9900933	1.0000000	1.55900	1740.3929	518.7000	775.8294	58.7981
26	.86207	1.4211E-02	.999887	1.000000	8.16727E-02	.9898825	.9996554	1.55882	1740.1964	518.7000	775.7747	58.7829
27	.89655	1.5370E-02	.998130	1.000000	8.21771E-02	.9867160	.9943065	1.55609	1737.1388	518.7000	774.9523	58.5470
28	.93150	1.6575E-02	.977030	1.000000	9.21390E-02	.9513181	.9319629	1.52319	1700.4158	518.7000	765.7504	55.7975
29	.96977	1.7826E-02	.832277	1.000000	1.58671E-01	.7456885	.5869510	1.29752	1448.4889	518.7000	712.3570	40.5818
30	.98963	1.8347E-02	.689385	1.000000	1.85155E-01	.5611476	.3564817	1.07475	1199.6013	518.7000	664.4313	30.4176
31	1.00621	1.8775E-02	.560269	1.000000	1.90228E-01	.4100736	.2145416	.87346	975.0884	518.7000	625.1970	24.1577
32	1.01950	1.9044E-02	.468057	1.000000	1.85376E-01	.3127227	.1416266	.72970	814.6025	518.7000	599.9148	20.9420
33	1.02426	1.9128E-02	.433712	1.000000	1.81889E-01	.2789481	.1194080	.67619	754.8642	518.7000	591.1435	19.9621
34	1.02941	1.9211E-02	.397506	1.000000	1.77290E-01	.2449076	.0985156	.61971	691.8167	518.7000	582.3030	19.0407
35	1.03504	1.9275E-02	.359004	1.000000	1.71349E-01	.2106031	.0789710	.55969	624.8080	518.7000	573.3941	18.1788
36	1.04130	1.9379E-02	.317653	1.000000	1.63716E-01	.1759954	.0607990	.49522	552.8407	518.7000	564.4064	17.3774
37	1.04846	1.9463E-02	.272485	1.000000	1.53797E-01	.1409506	.0440268	.42480	474.2302	518.7000	555.3052	16.6377
38	1.05698	1.9547E-02	.221576	1.000000	1.40423E-01	.1050780	.0286744	.34544	385.6301	518.7000	545.9890	15.9606
39	1.06810	1.9631E-02	.159643	1.000000	1.20248E-01	.0668454	.0146738	.24888	277.8412	518.7000	536.0599	15.3431
40	1.09170	1.9715E-02	.058843	1.000000	5.98465E-02	.0137907	.0019671	.09174	102.4094	518.7000	522.2815	14.7828
41	1.81112	1.9798E-02	.001069	1.000000	7.63974E-03	.0001711	.0000006	.00167	1.8602	518.7000	518.7444	14.6960
42	2.31700	1.9882E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (23) X= .30000 PRESSURE= 14.6960

		*	** DIMENSIONLESS **						**	** DIMENSIONAL **		*
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	.00000	.0	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2527	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	7.68439E-02	.9878727	1.0000000	1.55900	1740.3929	518.7000	775.2528	58.7981
24	.79310	1.2028E-02	1.000000	1.000000	7.68441E-02	.9878728	1.0000000	1.55900	1740.3929	518.7000	775.2528	58.7981
25	.82759	1.3097E-02	.999947	1.000000	7.68497E-02	.9877733	.9998396	1.55892	1740.3014	518.7000	775.2269	58.7910
26	.86208	1.4211E-02	.999299	1.000000	7.69715E-02	.9865695	.9978621	1.55791	1739.1729	518.7000	774.9143	58.7038
27	.89670	1.5370E-02	.992946	1.000000	7.91046E-02	.9752525	.9786643	1.54800	1728.1154	518.7000	771.9753	57.8572
28	.93223	1.6575E-02	.947824	1.000000	1.00644E-01	.9015247	.8512198	1.47766	1649.5866	518.7000	752.8280	52.2366
29	.97236	1.7826E-02	.779798	1.000000	1.66210E-01	.6707015	.4916215	1.21571	1357.1555	518.7000	692.8827	36.3775
30	.99316	1.8387E-02	.664784	1.000000	1.82797E-01	.5262833	.3252447	1.03640	1156.9855	518.7000	655.3770	29.0400
31	1.01059	1.8795E-02	.564790	1.000000	1.86355E-01	.4107638	.2186650	.88051	982.9561	518.7000	625.3763	24.3396
32	1.02271	1.9044E-02	.495286	1.000000	1.83822E-01	.3365135	.1610562	.77215	861.9919	518.7000	606.0933	21.7989
33	1.02715	1.9128E-02	.470009	1.000000	1.81957E-01	.3108432	.1429651	.73274	818.0001	518.7000	599.4267	21.0011
34	1.03181	1.9211E-02	.443707	1.000000	1.79521E-01	.2849509	.1256132	.69174	772.2237	518.7000	592.7024	20.2358
35	1.03675	1.9295E-02	.416261	1.000000	1.76444E-01	.2588511	.1090164	.64895	724.4572	518.7000	585.9242	19.5039
36	1.04200	1.9379E-02	.387519	1.000000	1.72636E-01	.2325547	.0931909	.60414	674.4346	518.7000	579.0950	18.8059
37	1.04765	1.9463E-02	.357276	1.000000	1.67973E-01	.2060656	.0781547	.55699	621.8002	518.7000	572.2157	18.1428
38	1.05377	1.9547E-02	.325248	1.000000	1.62283E-01	.1793748	.0637282	.50706	566.0593	518.7000	565.2840	17.5154
39	1.06053	1.9631E-02	.291019	1.000000	1.55306E-01	.1524468	.0505364	.45370	506.4870	518.7000	558.2908	16.9248
40	1.06812	1.9715E-02	.253930	1.000000	1.46616E-01	.1251878	.0380108	.39588	441.9362	518.7000	551.2116	16.3724
41	1.07695	1.9798E-02	.212815	1.000000	1.35397E-01	.0973463	.0263908	.33178	370.3814	518.7000	543.9810	15.8599
42	1.08784	1.9882E-02	.165083	1.000000	1.19570E-01	.0680865	.0157078	.25736	287.3096	518.7000	536.3822	15.3887
43	1.10388	1.9966E-02	.100246	1.000000	8.74971E-02	.0320484	.0057321	.15628	174.4677	518.7000	527.0230	14.9488
44	1.20749	2.0050E-02	.010075	1.000000	2.32700E-02	.0016754	.0000575	.01571	17.5342	518.7000	519.1351	14.6985
45	27.36473	2.0134E-02	.000003	1.000000	3.22192E-04	.0000003	.0000000	.00000	.0051	518.7000	518.7001	14.6960
46	38.68073	2.0218E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (25) X= .40000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
1	.00000	.0	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
20	.65517	8.2041E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
21	.68966	9.0947E-03	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	7.31469E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
23	.75862	1.1005E-02	1.000000	1.000000	7.31470E-02	.9862579	1.0000000	1.55900	1740.3929	518.7000	774.8334	58.7981
24	.79310	1.2028E-02	.999979	1.000000	7.31486E-02	.9862171	.9999347	1.55897	1740.3556	518.7000	774.8228	58.7952
25	.82759	1.3097E-02	.999731	1.000000	7.31793E-02	.9857496	.9991792	1.55858	1739.9247	518.7000	774.7014	58.7019
26	.86212	1.4211E-02	.997623	1.000000	7.36581E-02	.9818672	.9927663	1.55529	1736.2558	518.7000	773.6931	58.4791
27	.89693	1.5370E-02	.983070	1.000000	7.92319E-02	.9563700	.9494571	1.53261	1710.9288	518.7000	767.0714	56.5691
28	.93327	1.6575E-02	.914709	1.000000	1.10993E-01	.8480328	.7669410	1.42603	1591.9526	518.7000	738.9360	48.5197
29	.97493	1.7826E-02	.747492	1.000000	1.66876E-01	.6234542	.4394022	1.16534	1300.9301	518.7000	680.6125	34.0746
30	.99638	1.8387E-02	.647996	1.000000	1.78330E-01	.5001939	.3051445	1.01023	1127.7685	518.7000	648.6015	28.1535
31	1.01396	1.8725E-02	.564456	1.000000	1.80730E-01	.4043845	.2183588	.87999	982.3754	518.7000	623.7195	24.3261
32	1.02593	1.9044E-02	.507809	1.000000	1.79096E-01	.3437129	.1705589	.79167	883.7867	518.7000	607.9630	22.2180
33	1.03017	1.9128E-02	.487539	1.000000	1.77910E-01	.3228966	.1553595	.76007	848.5101	518.7000	602.5570	21.5477
34	1.03463	1.9211E-02	.466635	1.000000	1.76375E-01	.3019517	.1406572	.72748	812.1265	518.7000	597.1175	20.8993
35	1.03927	1.9275E-02	.445044	1.000000	1.74461E-01	.2808887	.1264607	.69382	774.5514	518.7000	591.6474	20.2732
36	1.04412	1.9379E-02	.422703	1.000000	1.72129E-01	.2597177	.1127786	.65899	735.6697	518.7000	586.1493	19.6698
37	1.04922	1.9463E-02	.399536	1.000000	1.69334E-01	.2384480	.0996202	.62288	695.3494	518.7000	580.6255	19.0895
38	1.05460	1.9547E-02	.375446	1.000000	1.66018E-01	.2170874	.0869954	.58532	653.4232	518.7000	575.0781	18.5327
39	1.06032	1.9631E-02	.350310	1.000000	1.62105E-01	.1956408	.0749157	.54613	609.6772	518.7000	569.5084	17.9999
40	1.06645	1.9715E-02	.323967	1.000000	1.57494E-01	.1741084	.0633941	.50507	563.8304	518.7000	563.9163	17.4918
41	1.07307	1.9798E-02	.296197	1.000000	1.52047E-01	.1524811	.0524468	.46177	515.4998	518.7000	558.2997	17.0090
42	1.08032	1.9882E-02	.266586	1.000000	1.45557E-01	.1307325	.0420936	.41576	464.1382	518.7000	552.6515	16.5524
43	1.08842	1.9966E-02	.234952	1.000000	1.37700E-01	.1087998	.0323598	.36629	408.9088	518.7000	546.9556	16.1231
44	1.09770	2.0050E-02	.200180	1.000000	1.27901E-01	.0865343	.0232766	.31208	348.3920	518.7000	541.1732	15.7225
45	1.10884	2.0134E-02	.160691	1.000000	1.14929E-01	.0635289	.0148702	.25052	279.6660	518.7000	535.1986	15.3518
46	1.12384	2.0218E-02	.110455	1.000000	9.42330E-02	.0377010	.0069681	.17220	192.2349	518.7000	528.4910	15.0033
47	1.16963	2.0301E-02	.025742	1.000000	3.90247E-02	.0050780	.0003758	.04013	44.8017	518.7000	520.0188	14.7126
48	4.25906	2.0385E-02	.000131	1.000000	3.31902E-03	.0000321	.0000000	.00020	.2287	518.7000	518.7083	14.6960
49	5.90857	2.0469E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (27)   X=   .50000   PRESSURE=   14.6960

N	Y	PSI*	UD	THD	TI	TID	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
1	.00000	.0	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
7	.20690	8.1856E-04	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
22	.72414	1.0027E-02	1.000000	1.000000	7.01378E-02	.9850024	1.0000000	1.55900	1740.3929	518.7000	774.5073	58.7981
23	.75862	1.1005E-02	.999994	1.000000	7.01383E-02	.9849901	.9999403	1.55899	1740.3816	518.7000	774.5041	58.7972
24	.79311	1.2028E-02	.999895	1.000000	7.01463E-02	.9848030	.9996810	1.55884	1740.2110	518.7000	774.4555	58.7840
25	.82760	1.3097E-02	.999145	1.000000	7.02601E-02	.9833938	.9973938	1.55767	1738.9053	518.7000	774.0896	58.6832
26	.86220	1.4211E-02	.994229	1.000000	7.15987E-02	.9744351	.9825179	1.55000	1730.3499	518.7000	771.7630	58.0271
27	.89732	1.5370E-02	.968696	1.000000	8.23203E-02	.9305903	.9082823	1.51020	1685.9119	518.7000	760.3764	54.7532
28	.93455	1.6575E-02	.883382	1.000000	1.20042E-01	.7994437	.6937964	1.37719	1537.4313	518.7000	726.3173	45.2939
29	.97749	1.7826E-02	.725173	1.000000	1.65075E-01	.5898084	.4059553	1.13055	1262.0863	518.7000	671.8746	32.5995
30	.99940	1.8387E-02	.636414	1.000000	1.73594E-01	.4808999	.2918266	.99217	1107.6106	518.7000	643.5908	27.5662
31	1.01709	1.8795E-02	.563655	1.000000	1.75201E-01	.3977775	.2176250	.87874	980.9817	518.7000	622.0037	24.2937
32	1.02490	1.9044E-02	.515188	1.000000	1.73927E-01	.3457270	.1763321	.80318	896.6299	518.7000	608.4861	22.4726
33	1.03310	1.9126E-02	.498032	1.000000	1.73053E-01	.3279711	.1631080	.77643	866.7718	518.7000	603.8748	21.8894
34	1.03743	1.9211E-02	.480440	1.000000	1.71940E-01	.3101442	.1502579	.74901	836.1545	518.7000	599.2451	21.3227
35	1.04190	1.9295E-02	.462384	1.000000	1.70572E-01	.2922544	.1377838	.72086	804.7291	518.7000	594.5991	20.7726
36	1.04654	1.9379E-02	.443830	1.000000	1.68930E-01	.2743100	.1256912	.69193	772.4382	518.7000	589.9349	20.2392
37	1.05135	1.9463E-02	.424740	1.000000	1.66291E-01	.2563190	.1139849	.66217	739.2148	518.7000	585.2666	19.7230
38	1.05637	1.9547E-02	.405069	1.000000	1.64729E-01	.2382895	.1026702	.63150	704.9789	518.7000	580.5843	19.2240
39	1.06161	1.9631E-02	.384761	1.000000	1.62112E-01	.2202292	.0917525	.59984	669.6346	518.7000	575.8940	18.7425
40	1.06712	1.9715E-02	.363748	1.000000	1.59101E-01	.2021453	.0812383	.56708	633.0645	518.7000	571.1976	18.2788
41	1.07293	1.9798E-02	.341947	1.000000	1.55644E-01	.1840434	.0711347	.53310	595.1230	518.7000	566.4965	17.8332
42	1.07910	1.9882E-02	.319252	1.000000	1.51677E-01	.1659271	.0614504	.49771	555.6243	518.7000	561.7916	17.4061
43	1.08570	1.9966E-02	.295523	1.000000	1.47113E-01	.1477961	.0521957	.46072	514.3261	518.7000	557.0830	16.9979
44	1.09283	2.0050E-02	.270571	1.000000	1.41834E-01	.1296428	.0433833	.42182	470.8990	518.7000	552.3685	16.6093
45	1.10061	2.0134E-02	.244125	1.000000	1.35666E-01	.1114461	.0350288	.38059	424.8741	518.7000	547.6428	16.2408
46	1.10928	2.0218E-02	.215776	1.000000	1.28338E-01	.0931574	.0271511	.33639	375.5347	518.7000	542.8932	15.8934
47	1.11916	2.0301E-02	.184824	1.000000	1.19389E-01	.0746655	.0197715	.28814	321.6657	518.7000	538.0908	15.5680
48	1.13093	2.0385E-02	.149857	1.000000	1.07872E-01	.0556836	.0129062	.23363	260.8092	518.7000	533.1612	15.2652
49	1.14639	2.0469E-02	.106547	1.000000	9.07913E-02	.0350235	.0064805	.16611	185.4344	518.7000	527.7957	14.9818
50	1.18281	2.0553E-02	.034124	1.000000	4.41563E-02	.0068081	.0006606	.05320	59.3890	518.7000	520.4681	14.7251

PROFILES-- STA (27) X= .50000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT *
51	2.52420	2.0637E-02	.000447	1.000000	5.41663E-03	.0000856	.0000001	.00070	.7774	518.7000	518.7222	14.6960
52	3.36811	2.0721E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (31) X= .70000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTO	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
1	.00000	.0	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
19	.62069	7.3668E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
20	.65517	8.2081E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
21	.68966	9.0949E-03	1.000000	1.000000	6.55193E-02	.9831779	1.0000000	1.55900	1740.3929	518.7000	774.0335	58.7981
22	.72414	1.0027E-02	.999986	1.000000	6.55200E-02	.9831505	.9999565	1.55898	1740.3660	518.7000	774.0264	58.7962
23	.75862	1.1005E-02	.999870	1.000000	6.55278E-02	.9829294	.9996042	1.55880	1740.1672	518.7000	773.9690	58.7807
24	.79312	1.2028E-02	.999191	1.000000	6.56139E-02	.9816443	.9975333	1.55774	1738.9850	518.7000	773.6352	58.6893
25	.82769	1.3097E-02	.995666	1.000000	6.64182E-02	.9751281	.9868459	1.55224	1732.8504	518.7000	771.9429	58.2180
26	.86258	1.4211E-02	.980280	1.000000	7.20997E-02	.9479084	.9413401	1.52826	1706.0718	518.7000	764.8739	56.2111
27	.89861	1.5370E-02	.930907	1.000000	9.45252E-02	.8671963	.8072305	1.45128	1620.1441	518.7000	743.9128	50.2968
28	.93767	1.6575E-02	.832336	1.000000	1.32273E-01	.7234177	.5870656	1.29761	1448.5912	518.7000	706.5732	40.5868
29	.98268	1.7826E-02	.693676	1.000000	1.61128E-01	.5429494	.3624214	1.08175	1207.6174	518.7000	659.7052	30.6796
30	1.00523	1.8367E-02	.620294	1.000000	1.66483E-01	.4541945	.2740117	.96704	1079.5555	518.7000	636.6553	26.7805
31	1.02307	1.8795E-02	.561683	1.000000	1.67370E-01	.3878111	.2158257	.87566	977.5499	518.7000	619.4154	24.2144
32	1.03473	1.9044E-02	.523494	1.000000	1.66515E-01	.3467529	.1829871	.81613	911.0848	518.7000	608.7525	22.7661
33	1.03882	1.9128E-02	.510151	1.000000	1.65965E-01	.3328325	.1723770	.79532	887.8626	518.7000	605.1373	22.2982
34	1.04301	1.9211E-02	.496562	1.000000	1.65276E-01	.3188892	.1620076	.77414	864.2124	518.7000	601.5162	21.8409
35	1.04723	1.9295E-02	.482716	1.000000	1.64444E-01	.3049282	.1518809	.75255	840.1151	518.7000	597.8905	21.3943
36	1.05168	1.9379E-02	.468601	1.000000	1.63460E-01	.2909545	.1419988	.73055	815.5494	518.7000	594.2615	20.9584
37	1.05619	1.9463E-02	.454203	1.000000	1.62317E-01	.2769734	.1323631	.70810	790.4912	518.7000	590.6306	20.5335
38	1.06083	1.9547E-02	.439506	1.000000	1.61006E-01	.2629903	.1229755	.68519	764.9134	518.7000	586.9992	20.1195
39	1.06560	1.9631E-02	.424493	1.000000	1.59518E-01	.2490105	.1138382	.66178	738.7850	518.7000	583.3686	19.7165
40	1.07053	1.9715E-02	.409144	1.000000	1.57841E-01	.2350395	.1049532	.63786	712.0710	518.7000	579.7403	19.3247
41	1.07562	1.9798E-02	.393435	1.000000	1.55960E-01	.2210830	.0963228	.61336	684.7306	518.7000	576.1157	18.9440
42	1.08090	1.9882E-02	.377338	1.000000	1.53861E-01	.2071463	.0879495	.58827	656.7170	518.7000	572.4963	18.5748
43	1.08638	1.9966E-02	.360824	1.000000	1.51524E-01	.1932349	.0798361	.56252	627.9748	518.7000	568.8835	18.2169
44	1.09210	2.0050E-02	.343853	1.000000	1.48927E-01	.1793541	.0719858	.53607	598.4386	518.7000	565.2787	17.8707
45	1.09808	2.0134E-02	.326380	1.000000	1.46042E-01	.1655089	.0644026	.50883	568.0300	518.7000	561.6830	17.5363
46	1.10436	2.0218E-02	.308352	1.000000	1.42835E-01	.1517034	.0570908	.48072	536.6532	518.7000	558.0977	17.2138
47	1.11098	2.0301E-02	.289698	1.000000	1.39263E-01	.1379410	.0500558	.45164	504.1892	518.7000	554.5236	16.9036
48	1.11801	2.0385E-02	.270334	1.000000	1.35272E-01	.1242230	.0433041	.42145	470.4869	518.7000	550.9610	16.6058
49	1.12554	2.0469E-02	.250144	1.000000	1.30787E-01	.1105480	.0368433	.38997	435.3490	518.7000	547.4096	16.3209
50	1.13365	2.0553E-02	.228976	1.000000	1.25707E-01	.0969088	.0306831	.35697	398.5073	518.7000	543.8674	16.0492

PROFILES-- STA (31) X= .70000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
51	1.19252	2.0637E-02	.206608	1.000000	1.19886E-01	.0832888	.0248348	.32210	359.5799	518.7000	540.3303	15.7913
52	1.15237	2.0721E-02	.182706	1.000000	1.13099E-01	.0696515	.0193120	.28484	317.9808	518.7000	536.7886	15.5477
53	1.16360	2.0805E-02	.156692	1.000000	1.04964E-01	.0559157	.0141284	.24428	272.7060	518.7000	533.2214	15.3191
54	1.17693	2.0888E-02	.127369	1.000000	9.47123E-02	.0418694	.0092883	.19857	221.6723	518.7000	529.5736	15.1056
55	1.19434	2.0972E-02	.091077	1.000000	7.98997E-02	.0266421	.0047265	.14199	158.5102	518.7000	525.6190	14.9044
56	1.23350	2.1056E-02	.030878	1.000000	4.12875E-02	.0058895	.0005408	.04814	53.7394	518.7000	520.2295	14.7199
57	2.58071	2.1140E-02	.000433	1.000000	5.43671E-03	.0000863	.0000001	.00067	.7529	518.7000	518.7224	14.6960
58	3.43491	2.1224E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (33) X= 1.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
1	.00000	.0	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7961
11	.34483	2.2737E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
15	.48276	4.4565E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
16	.51724	5.1159E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
17	.55172	5.8207E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
18	.58621	6.5710E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
19	.62069	7.3669E-03	1.000000	1.000000	6.05803E-02	.9813643	1.0000000	1.55900	1740.3929	518.7000	773.5625	58.7981
20	.65517	8.2081E-03	.999995	1.000000	6.05805E-02	.9813537	.9999832	1.55899	1740.3933	518.7000	773.5597	58.7974
21	.68966	9.0949E-03	.999944	1.000000	6.05825E-02	.9812558	.9998283	1.55891	1740.2949	518.7000	773.5343	58.7905
22	.72414	1.0027E-02	.999703	1.000000	6.06003E-02	.9807957	.9990951	1.55854	1739.8767	518.7000	773.4148	58.7582
23	.75866	1.1005E-02	.998651	1.000000	6.07425E-02	.9788044	.9958892	1.55690	1738.0450	518.7000	772.8977	58.6168
24	.79325	1.2028E-02	.994508	1.000000	6.17194E-02	.9711367	.9833548	1.55044	1730.8341	518.7000	770.9064	58.0640
25	.82816	1.3097E-02	.980387	1.000000	6.69263E-02	.9460187	.9416519	1.52842	1706.2591	518.7000	764.3832	56.2248
26	.86308	1.4211E-02	.942949	1.000000	8.40466E-02	.8836499	.8383399	1.47006	1641.1012	518.7000	748.1859	51.6686
27	.90182	1.5370E-02	.874469	1.000000	1.12707E-01	.7792648	.6740867	1.36330	1521.9202	518.7000	721.0768	44.4246
28	.94324	1.6575E-02	.780484	1.000000	1.39461E-01	.6479300	.4927802	1.21677	1358.3481	518.7000	686.9649	36.4286
29	.99039	1.7826E-02	.663708	1.000000	1.56160E-01	.4986036	.3239270	1.03472	1155.1121	518.7000	648.1685	28.9819
30	1.01354	1.8347E-02	.609380	1.000000	1.59139E-01	.4283126	.2572179	.94223	1051.8589	518.7000	629.9337	26.0399
31	1.03151	1.8725E-02	.558276	1.000000	1.59486E-01	.3766034	.2127415	.87035	971.6203	518.7000	616.5047	24.0783
32	1.04305	1.9044E-02	.528790	1.000000	1.58881E-01	.3449287	.1873191	.82438	920.3018	518.7000	608.2788	22.9572
33	1.04705	1.9128E-02	.518595	1.000000	1.58529E-01	.3342378	.1790413	.80849	902.5585	518.7000	605.5023	22.5921
34	1.05112	1.9211E-02	.508263	1.000000	1.58099E-01	.3235482	.1709143	.79239	884.5858	518.7000	602.7262	22.2337
35	1.05526	1.9295E-02	.497805	1.000000	1.57590E-01	.3128626	.1629387	.77608	866.3769	518.7000	599.9511	21.8819
36	1.05947	1.9379E-02	.487203	1.000000	1.56999E-01	.3021838	.1551150	.75955	847.9241	518.7000	597.1778	21.5369
37	1.06376	1.9463E-02	.476455	1.000000	1.56323E-01	.2915144	.1474437	.74279	829.2192	518.7000	594.4069	21.1986
38	1.06813	1.9547E-02	.465558	1.000000	1.55561E-01	.2808572	.1399253	.72580	810.2532	518.7000	591.6392	20.8670
39	1.07258	1.9631E-02	.454504	1.000000	1.54708E-01	.2702151	.1325604	.70857	791.0162	518.7000	588.8755	20.5422
40	1.07712	1.9715E-02	.443289	1.000000	1.53761E-01	.2595909	.1253496	.69109	771.4974	518.7000	586.1163	20.2242
41	1.08177	1.9798E-02	.431905	1.000000	1.52717E-01	.2489877	.1182932	.67334	751.6848	518.7000	583.3627	19.9130
42	1.08651	1.9882E-02	.420345	1.000000	1.51570E-01	.2384084	.1113921	.65532	731.5653	518.7000	580.6152	19.6086
43	1.09137	1.9966E-02	.408600	1.000000	1.50317E-01	.2278561	.1046467	.63701	711.1242	518.7000	577.8747	19.3111
44	1.09635	2.0050E-02	.396661	1.000000	1.48952E-01	.2173340	.0980577	.61839	690.3453	518.7000	575.1421	19.0206
45	1.10146	2.0134E-02	.384517	1.000000	1.47468E-01	.2068451	.0916261	.59946	669.2104	518.7000	572.4181	18.7369
46	1.10671	2.0218E-02	.372157	1.000000	1.45859E-01	.1963929	.0853526	.58019	647.6991	518.7000	569.7037	18.4602
47	1.11211	2.0301E-02	.359567	1.000000	1.44118E-01	.1859805	.0792382	.56057	625.7882	518.7000	566.9995	18.1906
48	1.11768	2.0385E-02	.346733	1.000000	1.42235E-01	.1756112	.0732840	.54056	603.4514	518.7000	564.3066	17.9280
49	1.12344	2.0469E-02	.333636	1.000000	1.40200E-01	.1652884	.0674915	.52014	580.6586	518.7000	561.6258	17.6725
50	1.12939	2.0553E-02	.320258	1.000000	1.38001E-01	.1550155	.0618621	.49928	557.3749	518.7000	558.9579	17.4242

PROFILES-- STA (33)   X= 1.00000   PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
51	1.13557	2.0637E-02	.306574	1.000000	1.35624E-01	.1447956	.0563975	.47795	533.5598	518.7000	556.3037	17.1833
52	1.14200	2.0721E-02	.292558	1.000000	1.33053E-01	.1346320	.0510999	.45610	509.1655	518.7000	553.6642	16.9496
53	1.14871	2.0805E-02	.278176	1.000000	1.30266E-01	.1245275	.0459718	.43368	484.1350	518.7000	551.0401	16.7235
54	1.15574	2.0888E-02	.263388	1.000000	1.27240E-01	.1144848	.0410159	.41062	458.3994	518.7000	548.4320	16.5049
55	1.16319	2.0972E-02	.248147	1.000000	1.23943E-01	.1045060	.0362358	.38686	431.8740	518.7000	545.8404	16.2941
56	1.17097	2.1056E-02	.232391	1.000000	1.20338E-01	.0945919	.0316355	.36230	404.4524	518.7000	543.2657	16.0912
57	1.17930	2.1140E-02	.216042	1.000000	1.16373E-01	.0847421	.0272200	.33681	375.9981	518.7000	540.7077	15.8965
58	1.18824	2.1224E-02	.198995	1.000000	1.11980E-01	.0749531	.0229953	.31023	346.3296	518.7000	538.1655	15.7101
59	1.19793	2.1308E-02	.181107	1.000000	1.07063E-01	.0652167	.0189687	.28235	315.1966	518.7000	535.6369	15.5326
60	1.20858	2.1391E-02	.162167	1.000000	1.01479E-01	.0555151	.0151490	.25282	282.2344	518.7000	533.1174	15.3641
61	1.22051	2.1475E-02	.141847	1.000000	9.49983E-02	.0458107	.0115471	.22114	246.8693	518.7000	530.5971	15.2053
62	1.23427	2.1559E-02	.119559	1.000000	8.71952E-02	.0360154	.0081746	.18639	208.0798	518.7000	528.0533	15.0565
63	1.25104	2.1643E-02	.093919	1.000000	7.70408E-02	.0258458	.0050276	.14642	163.4556	518.7000	525.4122	14.9177
64	1.27513	2.1727E-02	.058463	1.000000	5.90719E-02	.0134792	.0019417	.09114	101.7484	518.7000	522.2006	14.7816
65	1.41046	2.1811E-02	.006726	1.000000	2.01174E-02	.0012224	.0000256	.01049	11.7061	518.7000	519.0175	14.6971
66	1.53390	2.1894E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (37) X= 2.00000 PRESSURE= 14.6960

					** DIMENSIONLESS **			**		** DIMENSIONAL **		
N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
1	.00000	.0	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
12	.37931	2.7512E-03	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
13	.41379	3.2742E-03	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
14	.44828	3.8426E-03	1.000000	1.000000	5.15705E-02	.9784218	1.0000000	1.55900	1740.3929	518.7000	772.7983	58.7981
15	.48276	4.4565E-03	.999990	1.000000	5.15706E-02	.9784020	.9999689	1.55898	1740.3751	518.7000	772.7932	58.7967
16	.51724	5.1159E-03	.999958	1.000000	5.15711E-02	.9783403	.9998716	1.55893	1740.3196	518.7000	772.7772	58.7924
17	.53356	5.4438E-03	.999921	1.000000	5.15721E-02	.9782689	.9997588	1.55888	1740.2553	518.7000	772.7586	58.7875
18	.54940	5.7717E-03	.999861	1.000000	5.15742E-02	.9781536	.9995767	1.55878	1740.1515	518.7000	772.7287	58.7794
19	.56490	6.0997E-03	.999766	1.000000	5.15786E-02	.9779704	.9992865	1.55864	1739.9859	518.7000	772.6811	58.7666
20	.57778	6.4276E-03	.999517	1.000000	5.15877E-02	.9776843	.9988326	1.55840	1739.7269	518.7000	772.6068	58.7466
21	.59440	6.7555E-03	.999389	1.000000	5.16057E-02	.9772465	.9981363	1.55805	1739.3295	518.7000	772.4931	58.7159
22	.60866	7.0835E-03	.999045	1.000000	5.16404E-02	.9765898	.9970885	1.55751	1738.7309	518.7000	772.3226	58.6697
23	.62261	7.4114E-03	.998536	1.000000	5.17054E-02	.9756231	.9955407	1.55672	1737.8456	518.7000	772.0715	58.6018
24	.63626	7.7393E-03	.997797	1.000000	5.18237E-02	.9742263	.9932952	1.55557	1736.5591	518.7000	771.7088	58.5024
25	.64963	8.0673E-03	.996741	1.000000	5.20322E-02	.9722454	.9900954	1.55392	1734.7217	518.7000	771.1943	58.3613
26	.66275	8.3952E-03	.995260	1.000000	5.23887E-02	.9694890	.9856200	1.55161	1732.1431	518.7000	770.4785	58.1639
27	.67564	8.7231E-03	.993219	1.000000	5.29768E-02	.9657302	.9794839	1.54843	1728.5913	518.7000	769.5023	57.8933
28	.68831	9.0510E-03	.990465	1.000000	5.39091E-02	.9607173	.9712554	1.54413	1723.7980	518.7000	768.2004	57.5304
29	.70080	9.3790E-03	.986833	1.000000	5.53203E-02	.9541963	.9604969	1.53947	1717.4779	518.7000	766.5069	57.0559
30	.71312	9.7069E-03	.982170	1.000000	5.73464E-02	.9459484	.9468322	1.53120	1709.3621	518.7000	764.3649	56.4533
31	.72530	1.0035E-02	.976356	1.000000	6.00902E-02	.9358324	.9300274	1.52214	1699.2422	518.7000	761.7378	55.7122
32	.73735	1.0363E-02	.969326	1.000000	6.35866E-02	.9238162	.9100549	1.51118	1687.0087	518.7000	758.6171	54.8313
33	.74930	1.0691E-02	.961085	1.000000	6.77861E-02	.9099797	.8871064	1.49833	1672.6652	518.7000	755.0239	53.8193
34	.76117	1.1019E-02	.951688	1.000000	7.25687E-02	.8944879	.8615465	1.48368	1656.3114	518.7000	751.0005	52.6920
35	.77298	1.1347E-02	.941228	1.000000	7.77760E-02	.8775480	.8338342	1.46737	1638.1066	518.7000	746.6012	51.4698
36	.78475	1.1675E-02	.929808	1.000000	8.32451E-02	.8593721	.8044474	1.44957	1618.2315	518.7000	741.8809	50.1738
37	.79649	1.2002E-02	.917530	1.000000	8.88303E-02	.8401532	.7738335	1.43043	1596.8620	518.7000	736.8897	48.8237
38	.80823	1.2330E-02	.904482	1.000000	9.44124E-02	.8200567	.7423853	1.41009	1574.1547	518.7000	731.6706	47.4368
39	.81996	1.2658E-02	.890743	1.000000	9.98993E-02	.7992194	.7104357	1.38867	1550.2428	518.7000	726.2591	46.0277
40	.83171	1.2986E-02	.876375	1.000000	1.05222E-01	.7777532	.6782609	1.36627	1525.2364	518.7000	720.6842	44.6087
41	.84350	1.3314E-02	.861429	1.000000	1.10332E-01	.7557498	.6460880	1.34297	1499.2252	518.7000	714.9699	43.1898
42	.85532	1.3642E-02	.845948	1.000000	1.15194E-01	.7332852	.6141030	1.31883	1472.2819	518.7000	709.1358	41.7792
43	.86720	1.3970E-02	.829965	1.000000	1.19782E-01	.7104236	.5824574	1.29392	1444.4647	518.7000	703.1986	40.3836
44	.87916	1.4298E-02	.813506	1.000000	1.24080E-01	.6872199	.5512752	1.26826	1415.8202	518.7000	697.1726	39.0084
45	.89119	1.4626E-02	.796593	1.000000	1.28078E-01	.6637227	.5206569	1.24189	1386.3854	518.7000	691.0703	37.6581
46	.90332	1.4954E-02	.779243	1.000000	1.31768E-01	.6399752	.4906843	1.21484	1356.1892	518.7000	684.9030	36.3362
47	.91556	1.5282E-02	.761468	1.000000	1.35145E-01	.6160171	.4614232	1.18713	1325.2536	518.7000	678.6810	35.0457
48	.92793	1.5610E-02	.743277	1.000000	1.38208E-01	.5918852	.4329263	1.15877	1293.5947	518.7000	672.4139	33.7890
49	.94044	1.5938E-02	.724677	1.000000	1.40954E-01	.5676142	.4052354	1.12977	1261.2233	518.7000	666.1107	32.5677
50	.95310	1.6266E-02	.705672	1.000000	1.43382E-01	.5432372	.3783829	1.10014	1228.1457	518.7000	659.7799	31.3835

PROFILES-- STA (37) X= 2.00000 PRESSURE= 14.6960

		*			** DIMENSIONLESS	**			**	** DIMENSIONAL	**	*
N	Y	PSI	UD	THD	TI	TID	PTD	MACH	U	T	TOT	PTOT
51	.96594	1.6593E-02	.686261	1.000000	1.45492E-01	.5187862	.3523932	1.06988	1194.3634	518.7000	653.4299	30.2373
52	.97898	1.6921E-02	.666444	1.000000	1.47283E-01	.4942923	.3272843	1.03899	1159.8737	518.7000	647.0688	29.1299
53	.99224	1.7249E-02	.646216	1.000000	1.48753E-01	.4697861	.3030685	1.00745	1124.6697	518.7000	640.7045	28.0620
54	1.00574	1.7577E-02	.625571	1.000000	1.49900E-01	.4452977	.2797532	.97527	1088.7401	518.7000	634.3448	27.0337
55	1.01952	1.7905E-02	.604501	1.000000	1.50720E-01	.4208571	.2573422	.94242	1052.0688	518.7000	627.9975	26.0453
56	1.03359	1.8233E-02	.582992	1.000000	1.51209E-01	.3964942	.2358358	.90888	1014.6350	518.7000	621.6704	25.0969
57	1.04800	1.8561E-02	.561030	1.000000	1.51360E-01	.3722389	.2152316	.87465	976.4123	518.7000	615.3713	24.1882
58	1.06278	1.8889E-02	.538596	1.000000	1.51165E-01	.3481216	.1955252	.83967	937.3679	518.7000	609.1079	23.3191
59	1.07799	1.9217E-02	.515666	1.000000	1.50614E-01	.3241727	.1767106	.80392	897.4619	518.7000	602.8884	22.4893
60	1.09366	1.9545E-02	.492214	1.000000	1.49693E-01	.3004234	.1587809	.76736	856.6460	518.7000	596.7206	21.6986
61	1.10988	1.9873E-02	.468205	1.000000	1.48385E-01	.2769055	.1417282	.72993	814.8612	518.7000	590.6130	20.9465
62	1.12671	2.0201E-02	.443598	1.000000	1.46668E-01	.2536512	.1255449	.69157	772.0356	518.7000	584.5738	20.2328
63	1.14425	2.0529E-02	.418343	1.000000	1.44513E-01	.2306940	.1102234	.65220	728.0808	518.7000	578.6117	19.5571
64	1.16261	2.0857E-02	.392375	1.000000	1.41886E-01	.2080676	.0957572	.61171	682.8867	518.7000	572.7356	18.9191
65	1.18193	2.1185E-02	.365615	1.000000	1.38739E-01	.1858068	.0821411	.56999	636.3135	518.7000	566.9544	18.3186
66	1.20241	2.1512E-02	.337958	1.000000	1.35010E-01	.1639466	.0693718	.52688	588.1800	518.7000	561.2773	17.7554
67	1.22429	2.1840E-02	.309266	1.000000	1.30616E-01	.1425216	.0574493	.48215	538.2443	518.7000	555.7132	17.2296
68	1.24792	2.2168E-02	.279346	1.000000	1.25436E-01	.1215645	.0463775	.43550	486.1715	518.7000	550.2706	16.7413
69	1.27381	2.2496E-02	.247918	1.000000	1.19293E-01	.1011017	.0361665	.38650	431.4755	518.7000	544.9563	16.2910
70	1.30275	2.2824E-02	.214552	1.000000	1.11893E-01	.0811416	.0268354	.33449	373.4043	518.7000	539.7727	15.8795
71	1.33609	2.3152E-02	.178508	1.000000	1.02686E-01	.0616367	.0184179	.27829	310.6746	518.7000	534.7072	15.5083
72	1.37666	2.3480E-02	.138265	1.000000	9.03473E-02	.0423265	.0109646	.21556	240.6355	518.7000	529.6923	15.1796
73	1.43350	2.3808E-02	.087764	1.000000	6.85907E-02	.0211769	.0043873	.13682	152.7441	518.7000	524.1997	14.8895
74	1.67455	2.4136E-02	.013161	1.000000	2.08270E-02	.0014313	.0000982	.02052	22.9060	518.7000	519.0717	14.7003
75	16.95213	2.4464E-02	.000030	1.000000	1.02132E-03	.0000030	.0000000	.00005	.0526	518.7000	518.7008	14.6960
76	23.91538	2.4792E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (38) X= 2.50000 PRESSURE= 14.6960

N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
1	.00000	.0	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
7	.20690	8.1854E-04	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
8	.24138	1.1141E-03	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
9	.27586	1.4552E-03	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
10	.31034	1.8417E-03	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
11	.34483	2.2737E-03	1.000000	1.000000	4.89278E-02	.9776484	1.0000000	1.55900	1740.3929	518.7000	772.5975	58.7981
12	.37931	2.7512E-03	.999996	1.000000	4.89278E-02	.9776402	.9999872	1.55899	1740.3856	518.7000	772.5954	58.7975
13	.41379	3.2742E-03	.999980	1.000000	4.89280E-02	.9776099	.9999394	1.55897	1740.3583	518.7000	772.5875	58.7954
14	.44828	3.8426E-03	.999937	1.000000	4.89288E-02	.9775257	.9998066	1.55890	1740.2826	518.7000	772.5656	58.7896
15	.48276	4.4565E-03	.999821	1.000000	4.89324E-02	.9773015	.9994525	1.55872	1740.0807	518.7000	772.5074	58.7740
16	.51726	5.1159E-03	.999521	1.000000	4.89487E-02	.9767247	.9985388	1.55825	1739.5593	518.7000	772.3576	58.7337
17	.53359	5.4438E-03	.999228	1.000000	4.89738E-02	.9761641	.9976470	1.55780	1739.0500	518.7000	772.2120	58.6943
18	.54944	5.7717E-03	.998798	1.000000	4.90213E-02	.9753424	.9963357	1.55713	1738.3004	518.7000	771.9986	58.6365
19	.56485	6.0997E-03	.998173	1.000000	4.91096E-02	.9741571	.9944368	1.55615	1737.2135	518.7000	771.6908	58.5528
20	.57987	6.4276E-03	.997283	1.000000	4.92686E-02	.9724783	.9917354	1.55476	1735.6641	518.7000	771.2548	58.4336
21	.59452	6.7555E-03	.996037	1.000000	4.95448E-02	.9701464	.9879645	1.55292	1733.4952	518.7000	770.6492	58.2673
22	.60884	7.0835E-03	.994325	1.000000	5.00065E-02	.9669736	.9828058	1.55015	1730.5165	518.7000	769.8252	58.0398
23	.62286	7.4114E-03	.992022	1.000000	5.07465E-02	.9627508	.9759017	1.54656	1726.5088	518.7000	768.7285	57.7353
24	.63661	7.7393E-03	.988994	1.000000	5.18791E-02	.9572653	.9668847	1.54184	1721.2377	518.7000	767.3039	57.3377
25	.65011	8.0673E-03	.985110	1.000000	5.35247E-02	.9503285	.9554273	1.53579	1714.4786	518.7000	765.5024	56.8324
26	.66340	8.3952E-03	.980268	1.000000	5.57840E-02	.9418096	.9413053	1.52824	1706.0509	518.7000	763.2901	56.2096
27	.67649	8.7231E-03	.974407	1.000000	5.87077E-02	.9316645	.9244536	1.51910	1695.8510	518.7000	760.6554	55.4664
28	.68942	9.0510E-03	.967522	1.000000	6.22771E-02	.9199435	.9049871	1.50837	1683.8680	518.7000	757.6114	54.6078
29	.70221	9.3790E-03	.959655	1.000000	6.64082E-02	.9067750	.8831751	1.49610	1670.1762	518.7000	754.1915	53.6459
30	.71488	9.7069E-03	.950882	1.000000	7.09752E-02	.8923325	.8593825	1.48242	1654.9079	518.7000	750.4408	52.5966
31	.72745	1.0035E-02	.941294	1.000000	7.58389E-02	.8768018	.8340062	1.46748	1638.2212	518.7000	746.4074	51.4774
32	.73993	1.0363E-02	.930983	1.000000	8.08689E-02	.8603576	.8074282	1.45140	1620.2753	518.7000	742.1368	50.3053
33	.75235	1.0691E-02	.920031	1.000000	8.59551E-02	.8431521	.7799890	1.43433	1601.2160	518.7000	737.6685	49.0952
34	.76472	1.1019E-02	.908513	1.000000	9.10103E-02	.8253129	.7519834	1.41637	1581.1695	518.7000	733.0356	47.8601
35	.77704	1.1347E-02	.896488	1.000000	9.59686E-02	.8069444	.7236526	1.39763	1560.2417	518.7000	728.2653	46.6106
36	.78934	1.1675E-02	.884008	1.000000	1.00782E-01	.7881318	.6951981	1.37817	1538.5204	518.7000	723.3796	45.3557
37	.80162	1.2002E-02	.871112	1.000000	1.05415E-01	.7689450	.6667843	1.35806	1516.0775	518.7000	718.3967	44.1026
38	.81390	1.2330E-02	.857836	1.000000	1.09845E-01	.7494415	.6385451	1.33737	1492.9721	518.7000	713.3316	42.8572
39	.82619	1.2658E-02	.844207	1.000000	1.14055E-01	.7296699	.6105899	1.31612	1469.2527	518.7000	708.1969	41.6243
40	.83850	1.2986E-02	.830249	1.000000	1.18035E-01	.7096713	.5830076	1.29436	1444.9588	518.7000	703.0032	40.4079
41	.85083	1.3314E-02	.815979	1.000000	1.21777E-01	.6894818	.5558707	1.27211	1420.1232	518.7000	697.7600	39.2111
42	.86320	1.3642E-02	.801413	1.000000	1.25279E-01	.6691330	.5292378	1.24940	1394.7727	518.7000	692.4753	38.0365
43	.87563	1.3970E-02	.786563	1.000000	1.28539E-01	.6486533	.5031563	1.22625	1368.9291	518.7000	687.1567	36.8863
44	.88811	1.4298E-02	.771441	1.000000	1.31556E-01	.6280687	.4776641	1.20268	1342.6104	518.7000	681.8108	35.7620
45	.90066	1.4626E-02	.756054	1.000000	1.34331E-01	.6074030	.4527914	1.17869	1315.8308	518.7000	676.4439	34.6651
46	.91330	1.4954E-02	.740408	1.000000	1.36866E-01	.5866787	.4285614	1.15430	1288.6016	518.7000	671.0618	33.5965
47	.92603	1.5282E-02	.724510	1.000000	1.39162E-01	.5659168	.4049922	1.12951	1260.9314	518.7000	665.6699	32.5570
48	.93887	1.5610E-02	.708361	1.000000	1.41221E-01	.5451375	.3820967	1.10433	1232.8264	518.7000	660.2734	31.5473
49	.95183	1.5938E-02	.691965	1.000000	1.43044E-01	.5243601	.3598841	1.07877	1204.2905	518.7000	654.8775	30.5676
50	.96492	1.6266E-02	.675322	1.000000	1.44634E-01	.5036032	.3383599	1.05283	1175.3256	518.7000	649.4869	29.6184

PROFILES-- STA (38) X= 2.50000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT*
51	.97815	1.6593E-02	.658433	1.000000	1.45950E-01	.4828851	.3175269	1.02650	1145.9314	518.7000	644.1064	28.6996
52	.99155	1.6921E-02	.641295	1.000000	1.47113E-01	.4622235	.2973855	.99978	1116.1057	518.7000	638.7405	27.8113
53	1.00513	1.7249E-02	.623908	1.000000	1.48005E-01	.4416358	.2779337	.97267	1085.8445	518.7000	633.3938	26.9535
54	1.01891	1.7577E-02	.606266	1.000000	1.48663E-01	.4211391	.2591680	.94517	1055.1414	518.7000	628.0708	26.1259
55	1.03291	1.7905E-02	.588366	1.000000	1.49088E-01	.4007504	.2410835	.91726	1023.9881	518.7000	622.7758	25.3283
56	1.04714	1.8233E-02	.570201	1.000000	1.49277E-01	.3804866	.2236739	.88894	992.3740	518.7000	617.5132	24.5605
57	1.06164	1.8561E-02	.551764	1.000000	1.49228E-01	.3603644	.2069321	.86020	960.2857	518.7000	612.2874	23.8221
58	1.07644	1.8889E-02	.533045	1.000000	1.48937E-01	.3404004	.1908502	.83102	927.7073	518.7000	607.1028	23.1129
59	1.09155	1.9217E-02	.514033	1.000000	1.48399E-01	.3206116	.1754198	.80138	894.6194	518.7000	601.9636	22.4324
60	1.10702	1.9545E-02	.494715	1.000000	1.47608E-01	.3010147	.1606320	.77126	860.9992	518.7000	596.8742	21.7802
61	1.12283	1.9873E-02	.475076	1.000000	1.46557E-01	.2816267	.1464780	.74064	826.8194	518.7000	591.8391	21.1560
62	1.13920	2.0201E-02	.455097	1.000000	1.45236E-01	.2624648	.1329488	.70950	792.0477	518.7000	586.8627	20.5593
63	1.15600	2.0529E-02	.434756	1.000000	1.43633E-01	.2435463	.1200355	.67778	756.6455	518.7000	581.9495	19.9898
64	1.17336	2.0857E-02	.414025	1.000000	1.41734E-01	.2248890	.1077298	.64547	720.5669	518.7000	577.1042	19.4471
65	1.19134	2.1185E-02	.392875	1.000000	1.39522E-01	.2065109	.0960237	.61249	683.7562	518.7000	572.3313	18.9308
66	1.21005	2.1512E-02	.371264	1.000000	1.36974E-01	.1884304	.0849101	.57880	646.1460	518.7000	567.6358	18.4407
67	1.22959	2.1840E-02	.349127	1.000000	1.34062E-01	.1706663	.0743829	.54432	607.6531	518.7000	563.0224	17.9764
68	1.25008	2.2168E-02	.326463	1.000000	1.30753E-01	.1532377	.0644372	.50896	568.1736	518.7000	558.4962	17.5378
69	1.27171	2.2496E-02	.303135	1.000000	1.26999E-01	.1361640	.0550700	.47259	527.5746	518.7000	554.0621	17.1247
70	1.29471	2.2820E-02	.279065	1.000000	1.22740E-01	.1194640	.0462800	.43506	485.6826	518.7000	549.7251	16.7370
71	1.31937	2.3152E-02	.254117	1.000000	1.17894E-01	.1031556	.0380688	.39617	442.2625	518.7000	545.4898	16.3749
72	1.34613	2.3480E-02	.228099	1.000000	1.12339E-01	.0872532	.0304412	.35561	396.9812	518.7000	541.3599	16.0385
73	1.37564	2.3808E-02	.200722	1.000000	1.05895E-01	.0717630	.0234060	.31293	349.3354	518.7000	537.3370	15.7283
74	1.40894	2.4136E-02	.171509	1.000000	9.82628E-02	.0566702	.0169767	.26738	298.4934	518.7000	533.4174	15.4447
75	1.44794	2.4464E-02	.139552	1.000000	8.88577E-02	.0418963	.0111722	.21756	242.8758	518.7000	529.5806	15.1887
76	1.49717	2.4792E-02	.102638	1.000000	7.60612E-02	.0270726	.0060106	.16001	178.6297	518.7000	525.7308	14.9611
77	1.58018	2.5120E-02	.049881	1.000000	4.60970E-02	.0086030	.0014127	.07776	86.8128	518.7000	520.9342	14.7583
78	2.50378	2.5448E-02	.002382	1.000000	9.10495E-03	.0002469	.0000032	.00371	4.1454	518.7000	518.7641	14.6961
79	3.16873	2.5776E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (40) X= 3.40000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT*
1	.00000	.0	1.000000	1.000000	4.54984E-02	.9767054	1.0000000	1.55900	1740.3929	518.7000	772.3526	58.7981
2	.03448	2.2737E-05	1.000000	1.000000	4.54984E-02	.9767054	1.0000000	1.55900	1740.3929	518.7000	772.3526	58.7981
3	.06897	9.0949E-05	1.000000	1.000000	4.54984E-02	.9767054	1.0000000	1.55900	1740.3929	518.7000	772.3526	58.7981
4	.10345	2.0463E-04	1.000000	1.000000	4.54984E-02	.9767054	1.0000000	1.55900	1740.3929	518.7000	772.3526	58.7981
5	.13793	3.6379E-04	1.000000	1.000000	4.54984E-02	.9767054	1.0000000	1.55900	1740.3929	518.7000	772.3526	58.7981
6	.17241	5.6843E-04	1.000000	1.000000	4.54984E-02	.9767054	1.0000000	1.55900	1740.3929	518.7000	772.3526	58.7981
7	.20690	8.1854E-04	.999998	1.000000	4.54985E-02	.9767019	.9999945	1.55900	1740.3897	518.7000	772.3517	58.7979
8	.24138	1.1141E-03	.999989	1.000000	4.54985E-02	.9766846	.9999672	1.55898	1740.3742	518.7000	772.3472	58.7967
9	.27586	1.4552E-03	.999969	1.000000	4.54987E-02	.9766460	.9999065	1.55895	1740.3395	518.7000	772.3372	58.7940
10	.31035	1.8417E-03	.999924	1.000000	4.54996E-02	.9765581	.9997679	1.55888	1740.2605	518.7000	772.3143	58.7879
11	.34264	2.2442E-03	.999831	1.000000	4.55026E-02	.9763779	.9994834	1.55874	1740.0983	518.7000	772.2675	58.7753
12	.37214	2.6479E-03	.999657	1.000000	4.55113E-02	.9760432	.9989536	1.55847	1739.7960	518.7000	772.1806	58.7520
13	.39947	3.0510E-03	.999352	1.000000	4.55341E-02	.9754577	.9980243	1.55799	1739.2655	518.7000	772.0286	58.7110
14	.42506	3.4542E-03	.998843	1.000000	4.55894E-02	.9744840	.9964724	1.55720	1738.3786	518.7000	771.7757	58.6425
15	.44921	3.8573E-03	.998026	1.000000	4.57125E-02	.9729338	.9939427	1.55592	1736.9573	518.7000	771.3731	58.5330
16	.47215	4.2604E-03	.996766	1.000000	4.59679E-02	.9705622	.9901697	1.55396	1734.7644	518.7000	770.7572	58.3646
17	.49405	4.6635E-03	.994890	1.000000	4.64614E-02	.9670691	.9845068	1.55103	1731.5002	518.7000	769.8500	58.1148
18	.51507	5.0666E-03	.992127	1.000000	4.73483E-02	.9621170	.9764246	1.54684	1726.8132	518.7000	768.5639	57.7584
19	.53535	5.4697E-03	.988476	1.000000	4.88227E-02	.9553759	.9653516	1.54103	1720.3373	518.7000	766.8133	57.2700
20	.55496	5.8728E-03	.983547	1.000000	5.10741E-02	.9465955	.9508496	1.53335	1711.7585	518.7000	764.5330	56.6305
21	.57401	6.2759E-03	.977306	1.000000	5.42177E-02	.9356804	.9327571	1.52362	1700.8967	518.7000	761.6983	55.8326
22	.59257	6.6790E-03	.969755	1.000000	5.82368E-02	.9227250	.9112620	1.51185	1667.7546	518.7000	758.3337	54.8846
23	.61072	7.0821E-03	.960990	1.000000	6.29860E-02	.9079756	.8868465	1.49818	1672.5009	518.7000	754.5033	53.8078
24	.62851	7.4853E-03	.951165	1.000000	6.82479E-02	.8917495	.8601417	1.48287	1655.4006	518.7000	750.2893	52.6301
25	.64600	7.8884E-03	.940443	1.000000	7.38001E-02	.8743596	.8317858	1.46615	1636.7406	518.7000	745.7731	51.3795
26	.66323	8.2915E-03	.928976	1.000000	7.94551E-02	.8560744	.8023399	1.44827	1616.7827	518.7000	741.0244	50.0809
27	.68023	8.6946E-03	.916886	1.000000	8.50721E-02	.8371075	.7722612	1.42943	1595.7454	518.7000	736.0987	48.7543
28	.69704	9.0977E-03	.904280	1.000000	9.05530E-02	.8176235	.7419072	1.40977	1573.8033	518.7000	731.0386	47.4157
29	.71369	9.5008E-03	.891232	1.000000	9.58330E-02	.7977472	.7115523	1.38943	1551.0935	518.7000	725.8767	46.0770
30	.73019	9.9039E-03	.877803	1.000000	1.00871E-01	.7775745	.6814048	1.36850	1527.7229	518.7000	720.6378	44.7474
31	.74659	1.0307E-02	.864044	1.000000	1.05644E-01	.7571796	.6516226	1.34704	1503.7751	518.7000	715.3412	43.4339
32	.76288	1.0710E-02	.849920	1.000000	1.10137E-01	.7366210	.6223248	1.32513	1479.3162	518.7000	710.0021	42.1418
33	.77910	1.1113E-02	.835672	1.000000	1.14347E-01	.7159459	.5936008	1.30281	1454.3981	518.7000	704.6328	40.8750
34	.79527	1.1516E-02	.821115	1.000000	1.18271E-01	.6951934	.5655174	1.28012	1429.0627	518.7000	699.2433	39.6365
35	.81140	1.1919E-02	.806337	1.000000	1.21914E-01	.6743960	.5381237	1.25708	1403.3432	518.7000	693.8422	38.4284
36	.82750	1.2323E-02	.791354	1.000000	1.25280E-01	.6535821	.5114550	1.23372	1377.2666	518.7000	688.4367	37.2522
37	.84360	1.2726E-02	.776178	1.000000	1.28374E-01	.6327761	.4855356	1.21006	1350.8544	518.7000	683.0334	36.1091
38	.85970	1.3129E-02	.760819	1.000000	1.31203E-01	.6120001	.4603815	1.18612	1324.1239	518.7000	677.6378	34.9998
39	.87593	1.3532E-02	.745285	1.000000	1.33773E-01	.5912738	.4360018	1.16190	1297.0890	518.7000	672.2551	33.9246
40	.89201	1.3935E-02	.729583	1.000000	1.36091E-01	.5706154	.4123929	1.13742	1269.7604	518.7000	666.8901	32.8837
41	.90823	1.4338E-02	.713716	1.000000	1.38163E-01	.5500416	.3895753	1.11268	1242.1466	518.7000	661.5470	31.8771
42	.92454	1.4741E-02	.697689	1.000000	1.39995E-01	.5295682	.3675236	1.08770	1214.2534	518.7000	656.2300	30.9046
43	.94093	1.5144E-02	.681504	1.000000	1.41592E-01	.5092099	.3462378	1.06247	1186.0850	518.7000	650.9430	29.9658
44	.95742	1.5547E-02	.665162	1.000000	1.42959E-01	.4889809	.3257088	1.03699	1157.6438	518.7000	645.6894	29.0604
45	.97404	1.5951E-02	.648664	1.000000	1.44100E-01	.4688947	.3059255	1.01127	1128.9302	518.7000	640.4730	28.1880
46	.99080	1.6354E-02	.632009	1.000000	1.45019E-01	.4489642	.2868757	.98530	1099.9433	518.7000	635.2970	27.3478
47	1.00771	1.6757E-02	.615195	1.000000	1.45720E-01	.4292020	.2685461	.95909	1070.6807	518.7000	630.1647	26.5394
48	1.02481	1.7160E-02	.598220	1.000000	1.46204E-01	.4096203	.2509225	.93263	1041.1383	518.7000	625.0793	25.7622
49	1.04211	1.7563E-02	.581082	1.000000	1.46474E-01	.3902311	.2339903	.90591	1011.3105	518.7000	620.0439	25.0155
50	1.05964	1.7966E-02	.563775	1.000000	1.46529E-01	.3710461	.2177346	.87893	981.1901	518.7000	615.0615	24.2986

PROFILES-- STA (40) X= 3.40000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
51	1.07742	1.8369E-02	.546295	1.000000	1.46372E-01	.3520769	.2021403	.85167	950.7682	518.7000	610.1351	23.6108
52	1.09547	1.8772E-02	.528636	1.000000	1.46001E-01	.3333347	.1871922	.82414	920.0340	518.7000	605.2678	22.9516
53	1.11384	1.9175E-02	.510790	1.000000	1.45414E-01	.3148311	.1728753	.79632	888.9746	518.7000	600.4623	22.3202
54	1.13255	1.9579E-02	.492748	1.000000	1.44610E-01	.2965772	.1591747	.76819	857.5750	518.7000	595.7218	21.7159
55	1.15164	1.9982E-02	.474501	1.000000	1.43584E-01	.2785644	.1460760	.73975	825.8173	518.7000	591.0490	21.1383
56	1.17115	2.0385E-02	.456035	1.000000	1.42333E-01	.2608640	.1335651	.71096	793.6808	518.7000	586.4470	20.5865
57	1.19114	2.0788E-02	.437339	1.000000	1.40850E-01	.2434276	.1216285	.68181	761.1412	518.7000	581.9187	20.0601
58	1.21165	2.1171E-02	.418394	1.000000	1.39127E-01	.2262866	.1102532	.65228	728.1698	518.7000	577.4671	19.5584
59	1.23276	2.1594E-02	.399182	1.000000	1.37155E-01	.2094529	.0994268	.62232	694.7329	518.7000	573.0954	19.0809
60	1.25454	2.1997E-02	.379679	1.000000	1.34921E-01	.1929385	.0891381	.59192	660.7904	518.7000	568.8066	18.6272
61	1.27708	2.2400E-02	.359858	1.000000	1.32410E-01	.1767557	.0793763	.56102	626.2944	518.7000	564.6039	18.1967
62	1.30048	2.2803E-02	.339686	1.000000	1.29604E-01	.1609172	.0701320	.52957	591.1868	518.7000	560.4905	17.7890
63	1.32488	2.3207E-02	.319121	1.000000	1.26479E-01	.1454358	.0613969	.49751	555.3964	518.7000	556.4700	17.4037
64	1.35044	2.3610E-02	.298114	1.000000	1.23004E-01	.1303248	.0531639	.46476	518.8347	518.7000	552.5457	17.0406
65	1.37737	2.4013E-02	.276598	1.000000	1.19141E-01	.1155978	.0454278	.43122	481.3887	518.7000	548.7210	16.6995
66	1.40595	2.4416E-02	.254489	1.000000	1.14837E-01	.1012681	.0381849	.39675	442.9114	518.7000	544.9996	16.3800
67	1.43652	2.4819E-02	.231674	1.000000	1.10021E-01	.0873484	.0314342	.36118	403.2042	518.7000	541.3846	16.0823
68	1.46962	2.5222E-02	.207992	1.000000	1.04594E-01	.0738491	.0251772	.32426	361.9872	518.7000	537.8788	15.8064
69	1.50598	2.5625E-02	.183201	1.000000	9.84011E-02	.0607751	.0194189	.28561	318.8420	518.7000	534.4834	15.5524
70	1.54683	2.6028E-02	.156912	1.000000	9.11913E-02	.0481155	.0141687	.24463	273.0890	518.7000	531.1957	15.3209
71	1.59435	2.6431E-02	.128407	1.000000	8.24727E-02	.0358117	.0094417	.20019	223.4781	518.7000	528.0004	15.1124
72	1.65342	2.6835E-02	.096031	1.000000	7.09093E-02	.0235936	.0052576	.14971	167.1313	518.7000	524.8273	14.9279
73	1.74504	2.7238E-02	.052284	1.000000	4.70660E-02	.0091042	.0015523	.08151	90.9941	518.7000	521.0644	14.7645
74	2.44276	2.7641E-02	.003875	1.000000	1.14228E-02	.0003945	.0000085	.00604	6.7436	518.7000	518.8025	14.6964
75	2.98144	2.8044E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (42) X= 4.12865 PRESSURE= 14.6960

				** DIMENSIONLESS **				**	** DIMENSIONAL **		
N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
1	.00000	.0	.999999	1.000000	4.34584E-02	.9761753	.9999974	1.55900	1740.3914	518.7000	772.2149	58.7980
2	.03448	2.2737E-05	.999999	1.000000	4.34584E-02	.9761753	.9999974	1.55900	1740.3914	518.7000	772.2149	58.7980
3	.06897	9.0949E-05	.999998	1.000000	4.34584E-02	.9761730	.9999937	1.55900	1740.3893	518.7000	772.2143	58.7978
4	.10345	2.0463E-04	.999991	1.000000	4.34584E-02	.9761587	.9999714	1.55899	1740.3765	518.7000	772.2106	58.7968
5	.13793	3.6379E-04	.999977	1.000000	4.34586E-02	.9761326	.9999303	1.55896	1740.3531	518.7000	772.2038	58.7950
6	.17242	5.6843E-04	.999950	1.000000	4.34590E-02	.9760794	.9998464	1.55892	1740.3053	518.7000	772.1900	58.7913
7	.20690	8.1854E-04	.999894	1.000000	4.34603E-02	.9759714	.9996760	1.55883	1740.2081	518.7000	772.1619	58.7838
8	.24139	1.1141E-03	.999782	1.000000	4.34646E-02	.9757545	.9993335	1.55866	1740.0127	518.7000	772.1056	58.7687
9	.27588	1.4552E-03	.999559	1.000000	4.34776E-02	.9753262	.9986552	1.55831	1739.6257	518.7000	771.9944	58.7388
10	.31038	1.8417E-03	.999126	1.000000	4.35166E-02	.9744951	.9973342	1.55764	1738.8713	518.7000	771.7786	58.6805
11	.34270	2.2448E-03	.998363	1.000000	4.36183E-02	.9730423	.9950138	1.55645	1737.5439	518.7000	771.4013	58.5782
12	.37225	2.6479E-03	.997135	1.000000	4.38508E-02	.9707229	.9912875	1.55453	1735.4068	518.7000	770.7989	58.4139
13	.39967	3.0510E-03	.995256	1.000000	4.43297E-02	.9672118	.9856085	1.55160	1732.1365	518.7000	769.8871	58.1634
14	.42538	3.4542E-03	.992512	1.000000	4.52275E-02	.9621519	.9773667	1.54733	1727.3612	518.7000	768.5730	57.7999
15	.44970	3.8573E-03	.988690	1.000000	4.67567E-02	.9552118	.9659858	1.54137	1720.7099	518.7000	766.7707	57.2980
16	.47287	4.2604E-03	.983625	1.000000	4.91129E-02	.9461723	.9510777	1.53347	1711.8943	518.7000	764.4231	56.6405
17	.49508	4.6635E-03	.977249	1.000000	5.23914E-02	.9350058	.9325940	1.52353	1700.7980	518.7000	761.5231	55.8254
18	.51649	5.0666E-03	.969615	1.000000	5.65335E-02	.9218930	.9108688	1.51163	1687.5117	518.7000	758.1177	54.8672
19	.53722	5.4697E-03	.960868	1.000000	6.13509E-02	.9071556	.8865099	1.49799	1672.2881	518.7000	754.2903	53.7930
20	.55736	5.8728E-03	.951193	1.000000	6.66023E-02	.8911553	.8602173	1.48291	1655.4497	518.7000	750.1350	52.6334
21	.57701	6.2759E-03	.940771	1.000000	7.20631E-02	.8742196	.8326397	1.46666	1637.3104	518.7000	745.7368	51.4172
22	.59622	6.6790E-03	.929754	1.000000	7.75577E-02	.8566115	.8043107	1.44949	1618.1377	518.7000	741.1639	50.1678
23	.61506	7.0821E-03	.918266	1.000000	8.29628E-02	.8385298	.7756409	1.43158	1598.1433	518.7000	736.4681	48.9034
24	.63356	7.4853E-03	.906399	1.000000	8.81977E-02	.8201209	.7469365	1.41308	1577.4903	518.7000	731.6872	47.6375
25	.65178	7.8884E-03	.894225	1.000000	9.32129E-02	.8014919	.7184212	1.39410	1556.3024	518.7000	726.8492	46.3799
26	.66975	8.2915E-03	.881797	1.000000	9.79800E-02	.7827218	.6902579	1.37472	1534.6738	518.7000	721.9746	45.1378
27	.68749	8.6946E-03	.869158	1.000000	1.02485E-01	.7638695	.6625636	1.35502	1512.6762	518.7000	717.0786	43.9165
28	.70504	9.0977E-03	.856338	1.000000	1.06722E-01	.7449797	.6354221	1.33503	1490.3653	518.7000	712.1729	42.7195
29	.72242	9.5008E-03	.843364	1.000000	1.10693E-01	.7260872	.6088926	1.31480	1467.7840	518.7000	707.2665	41.5495
30	.73965	9.9039E-03	.830253	1.000000	1.14402E-01	.7072193	.5830157	1.29436	1444.9660	518.7000	702.3664	40.4082
31	.75675	1.0307E-02	.817021	1.000000	1.17856E-01	.6883981	.5578182	1.27374	1421.9380	518.7000	697.4765	39.2970
32	.77375	1.0710E-02	.803681	1.000000	1.21061E-01	.6696418	.5333165	1.25294	1398.7209	518.7000	692.6075	38.2164
33	.79066	1.1113E-02	.790242	1.000000	1.24027E-01	.6509656	.5095193	1.23199	1375.3316	518.7000	687.7572	37.1669
34	.80750	1.1516E-02	.776712	1.000000	1.26761E-01	.6323826	.4864289	1.21089	1351.7832	518.7000	682.9312	36.1485
35	.82428	1.1919E-02	.763096	1.000000	1.29273E-01	.6139042	.4640434	1.18967	1328.0862	518.7000	678.1323	35.1613
36	.84102	1.2323E-02	.749399	1.000000	1.31569E-01	.5955402	.4423571	1.16831	1304.2490	518.7000	673.3631	34.2049
37	.85774	1.2726E-02	.735626	1.000000	1.33659E-01	.5772998	.4213617	1.14684	1280.2779	518.7000	668.6261	33.2749
38	.87444	1.3129E-02	.721778	1.000000	1.35548E-01	.5591911	.4010469	1.12525	1256.1778	518.7000	663.9232	32.3830
39	.89114	1.3532E-02	.707859	1.000000	1.37243E-01	.5412215	.3814009	1.10355	1231.9521	518.7000	659.2564	31.5166
40	.90786	1.3935E-02	.693868	1.000000	1.38752E-01	.5233980	.3624107	1.08174	1207.6033	518.7000	654.6276	30.6791
41	.92462	1.4338E-02	.679808	1.000000	1.40070E-01	.5057271	.3440624	1.05982	1183.1327	518.7000	650.0385	29.8699
42	.94141	1.4741E-02	.665678	1.000000	1.41229E-01	.4882151	.3263418	1.03779	1158.5408	518.7000	645.4905	29.0884
43	.95826	1.5144E-02	.651478	1.000000	1.42207E-01	.4708676	.3092341	1.01565	1133.8271	518.7000	640.9854	28.3339
44	.97519	1.5547E-02	.637207	1.000000	1.43018E-01	.4536904	.2927245	.99341	1108.9908	518.7000	636.5244	27.6058
45	.99220	1.5951E-02	.622865	1.000000	1.43666E-01	.4366889	.2767978	.97105	1084.0298	518.7000	632.1091	26.9034
46	1.00931	1.6354E-02	.608450	1.000000	1.44153E-01	.4198681	.2614392	.94857	1058.9418	518.7000	627.7407	26.2260
47	1.02653	1.6757E-02	.593960	1.000000	1.44483E-01	.4032334	.2466339	.92598	1033.7235	518.7000	623.4206	25.5731
48	1.04389	1.7160E-02	.579393	1.000000	1.44658E-01	.3867895	.2323672	.90327	1008.3710	518.7000	619.1501	24.9439
49	1.06140	1.7563E-02	.564746	1.000000	1.44680E-01	.3705414	.2186248	.88044	982.8799	518.7000	614.9304	24.3378
50	1.07907	1.7966E-02	.550017	1.000000	1.44550E-01	.3544939	.2053926	.85748	957.2449	518.7000	610.7629	23.7542

PROFILES-- STA (42) X= 4.12865 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**	** DIMENSIONAL **			
51	1.09693	1.8369E-02	.535201	1.000000	1.44270E-01	.3386517	.1926569	.83438	931.4598	518.7000	606.6486	23.1926
52	1.11499	1.8772E-02	.520295	1.000000	1.43841E-01	.3230196	.1804042	.81114	905.5179	518.7000	602.5889	22.6522
53	1.13328	1.9175E-02	.505295	1.000000	1.43262E-01	.3076022	.1686217	.78775	879.4114	518.7000	598.5850	22.1326
54	1.15182	1.9579E-02	.490195	1.000000	1.42532E-01	.2924043	.1572968	.76421	853.1315	518.7000	594.6381	21.6331
55	1.17063	1.9982E-02	.474990	1.000000	1.41653E-01	.2774306	.1464174	.74051	826.6685	518.7000	590.7494	21.1533
56	1.18975	2.0385E-02	.459673	1.000000	1.40620E-01	.2626859	.1359719	.71663	800.0112	518.7000	586.9201	20.6926
57	1.20920	2.0788E-02	.444237	1.000000	1.39434E-01	.2481750	.1259490	.69257	773.1472	518.7000	583.1516	20.2506
58	1.22901	2.1191E-02	.428675	1.000000	1.38090E-01	.2339027	.1163382	.66830	746.0625	518.7000	579.4450	19.8268
59	1.24923	2.1594E-02	.412976	1.000000	1.36585E-01	.2198740	.1071292	.64383	718.7410	518.7000	575.8018	19.4206
60	1.26990	2.1997E-02	.397131	1.000000	1.34915E-01	.2060940	.0983125	.61913	691.1647	518.7000	572.2231	19.0318
61	1.29105	2.2400E-02	.381128	1.000000	1.33075E-01	.1925680	.0898790	.59418	663.3129	518.7000	568.7103	18.6599
62	1.31279	2.2803E-02	.364953	1.000000	1.31056E-01	.1793012	.0818203	.56896	635.1616	518.7000	565.2649	18.3044
63	1.33510	2.3207E-02	.348590	1.000000	1.28851E-01	.1662992	.0741284	.54345	606.6833	518.7000	561.8883	17.9652
64	1.35812	2.3610E-02	.332020	1.000000	1.26451E-01	.1535677	.0667961	.51762	577.8458	518.7000	558.5819	17.6419
65	1.38191	2.4013E-02	.315222	1.000000	1.23841E-01	.1411124	.0598170	.49143	548.6109	518.7000	555.3472	17.3341
66	1.40658	2.4416E-02	.298170	1.000000	1.21009E-01	.1289396	.0531852	.46485	518.9334	518.7000	552.1859	17.0416
67	1.43225	2.4819E-02	.280832	1.000000	1.17933E-01	.1170555	.0468959	.43782	488.7584	518.7000	549.0996	16.7642
68	1.45909	2.5222E-02	.263170	1.000000	1.14592E-01	.1054664	.0409450	.41028	458.0187	518.7000	546.0899	16.5018
69	1.48727	2.5625E-02	.245135	1.000000	1.10955E-01	.0941788	.0353296	.38216	426.6306	518.7000	543.1584	16.2541
70	1.51706	2.6028E-02	.226665	1.000000	1.06982E-01	.0831991	.0300480	.35337	394.4868	518.7000	540.3070	16.0212
71	1.54873	2.6431E-02	.207681	1.000000	1.02620E-01	.0725329	.0251002	.32378	361.4470	518.7000	537.5370	15.8030
72	1.58283	2.6835E-02	.188073	1.000000	9.77952E-02	.0621846	.0204879	.29321	327.3208	518.7000	534.8495	15.5996
73	1.62001	2.7238E-02	.167685	1.000000	9.23983E-02	.0521550	.0162153	.26142	291.8372	518.7000	532.2448	15.4111
74	1.66113	2.7641E-02	.146280	1.000000	8.62568E-02	.0424366	.0122896	.22805	254.5847	518.7000	529.7209	15.2380
75	1.70786	2.8044E-02	.123460	1.000000	7.90708E-02	.0330020	.0087217	.19247	214.8690	518.7000	527.2707	15.0806
76	1.76331	2.8447E-02	.098414	1.000000	7.02267E-02	.0237627	.0055232	.15343	171.2782	518.7000	524.8712	14.9396
77	1.83583	2.8850E-02	.069494	1.000000	5.77484E-02	.0142638	.0026665	.10677	119.1889	518.7000	522.4043	14.8136
78	2.00417	2.9253E-02	.021402	1.000000	2.77488E-02	.0026869	.0002598	.03337	37.2487	518.7000	519.3978	14.7075
79	6.74684	2.9656E-02	.000257	1.000000	3.20262E-03	.0000299	.0000000	.00040	.4473	518.7000	518.7078	14.6960
80	9.32861	3.0059E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (43) X= 5.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
1	.00000	.0	.999805	1.000000	4.17339E-02	.9753712	.9994058	1.55870	1740.0540	518.7000	772.0061	58.7719
2	.03965	3.0059E-05	.999805	1.000000	4.17339E-02	.9753712	.9994058	1.55870	1740.0540	518.7000	772.0061	58.7719
3	.05692	6.1942E-05	.999782	1.000000	4.17348E-02	.9753271	.9993362	1.55866	1740.0143	518.7000	771.9946	58.7688
4	.07077	9.5758E-05	.999752	1.000000	4.17361E-02	.9752686	.9992438	1.55861	1739.9616	518.7000	771.9795	58.7648
5	.08298	1.3162E-04	.999716	1.000000	4.17378E-02	.9751984	.9991328	1.55856	1739.8982	518.7000	771.9612	58.7599
6	.09421	1.6967E-04	.999673	1.000000	4.17401E-02	.9751163	.9990028	1.55849	1739.8241	518.7000	771.9399	58.7541
7	.10481	2.1001E-04	.999624	1.000000	4.17429E-02	.9750211	.9988521	1.55841	1739.7381	518.7000	771.9152	58.7475
8	.11500	2.5281E-04	.999567	1.000000	4.17466E-02	.9749110	.9986778	1.55832	1739.6386	518.7000	771.8866	58.7398
9	.12490	2.9820E-04	.999501	1.000000	4.17512E-02	.9747839	.9984763	1.55822	1739.5236	518.7000	771.8536	58.7309
10	.13461	3.4635E-04	.999424	1.000000	4.17571E-02	.9746370	.9982432	1.55810	1739.3905	518.7000	771.8154	58.7206
11	.14419	3.9741E-04	.999336	1.000000	4.17646E-02	.9744671	.9979734	1.55796	1739.2364	518.7000	771.7713	58.7087
12	.15370	4.5157E-04	.999233	1.000000	4.17743E-02	.9742701	.9976604	1.55780	1739.0577	518.7000	771.7201	58.6949
13	.16312	5.0901E-04	.999113	1.000000	4.17866E-02	.9740416	.9972968	1.55762	1738.8499	518.7000	771.6608	58.6789
14	.17269	5.6992E-04	.998974	1.000000	4.18024E-02	.9737758	.9968736	1.55740	1738.6080	518.7000	771.5918	58.6602
15	.18222	6.3457E-04	.998812	1.000000	4.18226E-02	.9734662	.9963798	1.55715	1738.3257	518.7000	771.5113	58.6385
16	.19182	7.0311E-04	.998623	1.000000	4.18487E-02	.9731047	.9958026	1.55685	1737.9955	518.7000	771.4175	58.6130
17	.20150	7.7581E-04	.998400	1.000000	4.18822E-02	.9726818	.9951265	1.55651	1737.6085	518.7000	771.3077	58.5832
18	.21128	8.5272E-04	.998139	1.000000	4.19255E-02	.9721862	.9943328	1.55610	1737.1539	518.7000	771.1789	58.5482
19	.22119	9.3470E-04	.997831	1.000000	4.19816E-02	.9716042	.9933991	1.55562	1736.6188	518.7000	771.0278	58.5070
20	.23124	1.0214E-03	.997469	1.000000	4.20542E-02	.9709194	.9922986	1.55505	1735.9875	518.7000	770.8499	58.4585
21	.24145	1.1134E-03	.997000	1.000000	4.21483E-02	.9701123	.9909990	1.55439	1735.2411	518.7000	770.6403	58.4011
22	.25183	1.2110E-03	.996532	1.000000	4.22705E-02	.9691594	.9894616	1.55359	1734.3571	518.7000	770.3929	58.3333
23	.26239	1.3145E-03	.995929	1.000000	4.24294E-02	.9680329	.9876399	1.55265	1733.3082	518.7000	770.1003	58.2530
24	.27316	1.4243E-03	.995213	1.000000	4.26357E-02	.9666997	.9854788	1.55154	1732.0616	518.7000	769.7541	58.1577
25	.28415	1.5408E-03	.994361	1.000000	4.29036E-02	.9651206	.9829128	1.55021	1730.5744	518.7000	769.3440	58.0445
26	.29536	1.6642E-03	.993346	1.000000	4.32508E-02	.9632497	.9798647	1.54863	1728.8123	518.7000	768.8581	57.9101
27	.30682	1.7952E-03	.992137	1.000000	4.36993E-02	.9610339	.9762451	1.54674	1726.7087	518.7000	768.2827	57.7505
28	.31854	1.9342E-03	.990699	1.000000	4.42761E-02	.9584124	.9719513	1.54450	1724.2047	518.7000	767.6019	57.5611
29	.33053	2.0815E-03	.988988	1.000000	4.50130E-02	.9553175	.9668683	1.54183	1721.2281	518.7000	766.7981	57.3369
30	.34282	2.2378E-03	.986960	1.000000	4.59463E-02	.9516751	.9608711	1.53867	1717.6987	518.7000	765.8522	57.0724
31	.35541	2.4036E-03	.984565	1.000000	4.71153E-02	.9474075	.9538280	1.53494	1713.5296	518.7000	764.7439	56.7618
32	.36833	2.5794E-03	.981750	1.000000	4.85594E-02	.9424368	.9456080	1.53055	1708.6301	518.7000	763.4529	56.3993
33	.38160	2.7659E-03	.978463	1.000000	5.03153E-02	.9366885	.9360880	1.52542	1702.9099	518.7000	761.9601	55.9795
34	.39524	2.9637E-03	.974655	1.000000	5.24119E-02	.9300973	.9251628	1.51949	1696.2834	518.7000	760.2484	55.4976
35	.40926	3.1735E-03	.970284	1.000000	5.48660E-02	.9226104	.9127529	1.51267	1688.6746	518.7000	758.3030	54.9503
36	.42370	3.3960E-03	.965311	1.000000	5.76825E-02	.9141902	.8988107	1.50492	1680.0199	518.7000	756.1172	54.3354
37	.43857	3.6320E-03	.959708	1.000000	6.08489E-02	.9048147	.8833222	1.49619	1670.2695	518.7000	753.6824	53.6524
38	.45390	3.8821E-03	.953455	1.000000	6.43412E-02	.8944756	.8663047	1.48644	1659.3869	518.7000	750.9973	52.9019
39	.46973	4.1478E-03	.946536	1.000000	6.81246E-02	.8831745	.8478013	1.47565	1647.3452	518.7000	748.0624	52.0858
40	.48607	4.4294E-03	.938940	1.000000	7.21583E-02	.8709193	.8278741	1.46381	1634.1242	518.7000	744.8797	51.2070
41	.50297	4.7281E-03	.930656	1.000000	7.63981E-02	.8577195	.8065976	1.45089	1619.7065	518.7000	741.4517	50.2687
42	.52044	5.0449E-03	.921673	1.000000	8.07997E-02	.8435842	.7840531	1.43689	1604.0739	518.7000	737.7807	49.2744
43	.53854	5.3809E-03	.911981	1.000000	8.53201E-02	.8285194	.7603251	1.42178	1587.2052	518.7000	733.8683	48.2279
44	.55730	5.7373E-03	.901563	1.000000	8.99186E-02	.8125273	.7354987	1.40554	1569.0745	518.7000	729.7152	47.1330
45	.57676	6.1153E-03	.890403	1.000000	9.45573E-02	.7956058	.7096589	1.38814	1549.6502	518.7000	725.3206	45.9935
46	.59695	6.5162E-03	.878476	1.000000	9.92008E-02	.7777486	.6828900	1.36954	1528.8942	518.7000	720.6831	44.8129
47	.61794	6.9415E-03	.865759	1.000000	1.03816E-01	.7589458	.6552765	1.34972	1506.7615	518.7000	715.7999	43.5951
48	.63978	7.3925E-03	.852221	1.000000	1.08371E-01	.7391844	.6269030	1.32861	1483.2000	518.7000	710.6678	42.3437
49	.66251	7.8709E-03	.837828	1.000000	1.12836E-01	.7184490	.5978554	1.30617	1458.1506	518.7000	705.2828	41.0627
50	.68621	8.3782E-03	.822542	1.000000	1.17181E-01	.6967226	.5682216	1.28234	1431.5463	518.7000	699.6404	39.7558

PROFILES-- STA (43) X= 5.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
				** DIMENSIONLESS **				**		** DIMENSIONAL **		
51	.71095	8.9164E-03	.806319	1.000000	1.21377E-01	.6739877	.5380917	1.25705	1403.3125	518.7000	693.7361	38.4270
52	.73680	9.4872E-03	.789113	1.000000	1.25393E-01	.6502270	.5075592	1.23023	1373.3663	518.7000	687.5654	37.0804
53	.76385	1.0023E-02	.770869	1.000000	1.29200E-01	.6254243	.4767212	1.20179	1341.6156	518.7000	681.1241	35.7204
54	.79220	1.0735E-02	.751531	1.000000	1.32764E-01	.5995658	.4456788	1.17164	1307.9592	518.7000	674.4086	34.3514
55	.82198	1.1416E-02	.731033	1.000000	1.36052E-01	.5726410	.4145372	1.13968	1272.2848	518.7000	667.4162	32.9780
56	.85329	1.2138E-02	.709304	1.000000	1.39026E-01	.5446445	.3834061	1.10581	1234.4683	518.7000	660.1454	31.6050
57	.88631	1.2904E-02	.686266	1.000000	1.41646E-01	.5155769	.3523998	1.06989	1194.3722	518.7000	652.5965	30.2376
58	.92120	1.3717E-02	.661829	1.000000	1.43868E-01	.4854471	.3216370	1.03179	1151.8429	518.7000	644.7717	28.8809
59	.95818	1.4579E-02	.635896	1.000000	1.45640E-01	.4542737	.2912407	.99136	1106.7082	518.7000	636.6759	27.5403
60	.99750	1.5493E-02	.608357	1.000000	1.46907E-01	.4220880	.2613382	.94842	1058.7732	518.7000	628.3172	26.2216
61	1.03945	1.6463E-02	.579073	1.000000	1.47603E-01	.3889364	.2320610	.90278	1007.8148	518.7000	619.7076	24.9304
62	1.08442	1.7491E-02	.547907	1.000000	1.47650E-01	.3548838	.2035448	.85419	953.5740	518.7000	610.8641	23.6728
63	1.13290	1.8582E-02	.514680	1.000000	1.46959E-01	.3200183	.1759301	.80239	895.7449	518.7000	601.8095	22.4549
64	1.18548	1.9739E-02	.479178	1.000000	1.45416E-01	.2844559	.1493628	.74704	833.9580	518.7000	592.5738	21.2832
65	1.24301	2.0966E-02	.441139	1.000000	1.42883E-01	.2483476	.1239965	.68774	767.7547	518.7000	583.1964	20.1645
66	1.30662	2.2268E-02	.400223	1.000000	1.39177E-01	.2118883	.0999961	.62395	696.5460	518.7000	573.7279	19.1060
67	1.37798	2.3648E-02	.355978	1.000000	1.34043E-01	.1753265	.0775451	.55497	619.5421	518.7000	564.2327	18.1159
68	1.45972	2.5112E-02	.307758	1.000000	1.27091E-01	.1389730	.0548588	.47980	535.6203	518.7000	554.7916	17.2036
69	1.55636	2.6665E-02	.254554	1.000000	1.17620E-01	.1031839	.0382050	.39685	443.0236	518.7000	545.4971	16.3809
70	1.67720	2.8312E-02	.194409	1.000000	1.03975E-01	.0681678	.0219236	.30308	338.3477	518.7000	536.4033	15.6629
71	1.85225	3.0059E-02	.119324	1.000000	7.74081E-02	.0312696	.0081422	.18603	207.6706	518.7000	526.8208	15.0551
72	2.60148	3.1912E-02	.016532	1.000000	2.09121E-02	.0015388	.0001550	.02577	28.7722	518.7000	519.0996	14.7028
73	30.44619	3.3878E-02	.000056	1.000000	1.20352E-03	.0000042	.0000000	.00009	.0975	518.7000	518.7011	14.6960
74	43.62314	3.5962E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (45) X= 6.20000 PRESSURE= 14.6960

			** DIMENSIONLESS **						** DIMENSIONAL **			
N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
1	.00000	.0	.995253	1.000000	4.03751E-02	.9662298	.9855983	1.55160	1732.1306	518.7000	769.6321	58.1630
2	.03974	3.0059E-05	.995253	1.000000	4.03751E-02	.9662298	.9855983	1.55160	1732.1306	518.7000	769.6321	58.1630
3	.05705	6.1942E-05	.994941	1.000000	4.04654E-02	.9656481	.9846577	1.55111	1731.5874	518.7000	769.4810	58.1215
4	.07094	9.5758E-05	.994536	1.000000	4.05869E-02	.9648948	.9834386	1.55048	1730.8826	518.7000	769.2853	58.0677
5	.08318	1.3162E-04	.994063	1.000000	4.07348E-02	.9640170	.9820166	1.54974	1730.0596	518.7000	769.0574	58.0050
6	.09445	1.6967E-04	.993526	1.000000	4.09104E-02	.9630233	.9804048	1.54891	1729.1255	518.7000	768.7993	57.9339
7	.10510	2.1001E-04	.992924	1.000000	4.11168E-02	.9619109	.9785982	1.54797	1728.0770	518.7000	768.5104	57.8542
8	.11533	2.5281E-04	.992251	1.000000	4.13583E-02	.9606724	.9765841	1.54692	1726.9060	518.7000	768.1888	57.7654
9	.12527	2.9820E-04	.991501	1.000000	4.16400E-02	.9592974	.9743448	1.54575	1725.6017	518.7000	767.8317	57.6667
10	.13503	3.4635E-04	.990668	1.000000	4.19681E-02	.9577734	.9718593	1.54445	1724.1509	518.7000	767.4359	57.5570
11	.14467	3.9741E-04	.989741	1.000000	4.23493E-02	.9560862	.9691035	1.54301	1722.5387	518.7000	766.9977	57.4355
12	.15425	4.5157E-04	.988712	1.000000	4.27913E-02	.9542200	.9660510	1.54140	1720.7482	518.7000	766.5131	57.3009
13	.16391	5.0901E-04	.987571	1.000000	4.33025E-02	.9521578	.9626727	1.53962	1718.7609	518.7000	765.9775	57.1519
14	.17337	5.6994E-04	.986304	1.000000	4.38920E-02	.9498811	.9589380	1.53765	1716.5570	518.7000	765.3863	56.9872
15	.18301	6.3457E-04	.984901	1.000000	4.45693E-02	.9473708	.9548143	1.53546	1714.1150	518.7000	764.7303	56.8053
16	.19270	7.0311E-04	.983348	1.000000	4.53445E-02	.9446069	.9502682	1.53304	1711.4123	518.7000	764.0165	56.6048
17	.20249	7.7581E-04	.981632	1.000000	4.62277E-02	.9415689	.9452658	1.53036	1708.4254	518.7000	763.2276	56.3842
18	.21240	8.5292E-04	.979739	1.000000	4.72285E-02	.9382367	.9397735	1.52741	1705.1303	518.7000	762.3622	56.1420
19	.22245	9.3470E-04	.977654	1.000000	4.83562E-02	.9345903	.9337587	1.52416	1701.5027	518.7000	761.4152	55.8767
20	.23266	1.0214E-03	.975365	1.000000	4.96188E-02	.9306109	.9271909	1.52059	1697.5186	518.7000	760.3817	55.5871
21	.24304	1.1134E-03	.972858	1.000000	5.10228E-02	.9262807	.9200426	1.51669	1693.1548	518.7000	759.2572	55.2718
22	.25362	1.2110E-03	.970119	1.000000	5.25733E-02	.9215838	.9122897	1.51202	1688.3889	518.7000	758.0374	54.9299
23	.26441	1.3145E-03	.967138	1.000000	5.42729E-02	.9165060	.9039122	1.50777	1683.1999	518.7000	756.7187	54.5604
24	.27542	1.4243E-03	.963902	1.000000	5.61221E-02	.9110354	.8948050	1.50272	1677.5685	518.7000	755.2979	54.1628
25	.28668	1.5408E-03	.960402	1.000000	5.81192E-02	.9051617	.8852273	1.49727	1671.4766	518.7000	753.7725	53.7364
26	.29820	1.6642E-03	.956628	1.000000	6.02606E-02	.8988768	.8749030	1.49138	1664.9080	518.7000	752.1403	53.2811
27	.31000	1.7952E-03	.952571	1.000000	6.25404E-02	.8921738	.8639203	1.48506	1657.8475	518.7000	750.3995	52.7967
28	.32209	1.9342E-03	.948223	1.000000	6.49514E-02	.8850472	.8522810	1.47828	1650.2809	518.7000	748.5487	52.2834
29	.33450	2.0815E-03	.943577	1.000000	6.74850E-02	.8774923	.8399001	1.47104	1642.1946	518.7000	746.5867	51.7413
30	.34724	2.2378E-03	.938624	1.000000	7.01315E-02	.8695045	.8270553	1.46332	1633.5752	518.7000	744.5123	51.1709
31	.36033	2.4036E-03	.933358	1.000000	7.28806E-02	.8610797	.8134862	1.45510	1624.4094	518.7000	742.3243	50.5725
32	.37379	2.5794E-03	.927769	1.000000	7.57218E-02	.8522131	.7992041	1.44639	1614.6831	518.7000	740.0216	49.9466
33	.38764	2.7659E-03	.921850	1.000000	7.86442E-02	.8428995	.7844913	1.43716	1604.3813	518.7000	737.6029	49.2937
34	.40190	2.9637E-03	.915591	1.000000	8.16367E-02	.8331329	.7690913	1.42741	1593.4882	518.7000	735.0665	48.6146
35	.41659	3.1735E-03	.908982	1.000000	8.46885E-02	.8229066	.7531081	1.41710	1581.9865	518.7000	732.4107	47.9097
36	.43174	3.3960E-03	.902013	1.000000	8.77887E-02	.8122126	.7365564	1.40624	1569.8573	518.7000	729.6334	47.1797
37	.44737	3.6320E-03	.894672	1.000000	9.09269E-02	.8010421	.7194515	1.39479	1557.0801	518.7000	726.7324	46.4253
38	.46351	3.8823E-03	.886945	1.000000	9.40922E-02	.7893851	.7018095	1.38275	1543.6326	518.7000	723.7051	45.6473
39	.48017	4.1478E-03	.878819	1.000000	9.72744E-02	.7772307	.6836470	1.37008	1529.4904	518.7000	720.5486	44.8463
40	.49740	4.4294E-03	.870279	1.000000	1.00463E-01	.7645671	.6649816	1.35676	1514.6270	518.7000	717.2598	44.0231
41	.51521	4.7281E-03	.861308	1.000000	1.03647E-01	.7513812	.6458318	1.34278	1499.0139	518.7000	713.8354	43.1785
42	.53365	5.0449E-03	.851888	1.000000	1.06817E-01	.7376594	.6262175	1.32809	1482.6200	518.7000	710.2718	42.3135
43	.55275	5.3809E-03	.842001	1.000000	1.09962E-01	.7233873	.6061595	1.31268	1465.4119	518.7000	706.5653	41.4289
44	.57254	5.7373E-03	.831625	1.000000	1.13070E-01	.7085497	.5856805	1.29650	1447.3537	518.7000	702.7119	40.5257
45	.59307	6.1153E-03	.820738	1.000000	1.16130E-01	.6931311	.5648047	1.27953	1428.4065	518.7000	698.7077	39.6051
46	.61438	6.5162E-03	.809316	1.000000	1.19132E-01	.6771156	.5435582	1.26172	1408.5286	518.7000	694.5484	38.6681
47	.63651	6.9415E-03	.797335	1.000000	1.22062E-01	.6604871	.5219693	1.24304	1387.6753	518.7000	690.2300	37.7159
48	.65952	7.3925E-03	.784764	1.000000	1.24907E-01	.6432295	.5000682	1.22345	1365.7984	518.7000	685.7481	36.7501
49	.68346	7.8709E-03	.771576	1.000000	1.27655E-01	.6253270	.4778878	1.20289	1342.8461	518.7000	681.0988	35.7719
50	.70839	8.3782E-03	.757739	1.000000	1.30290E-01	.6067645	.4554635	1.18131	1318.7629	518.7000	676.2781	34.7829

PROFILES-- STA (95) X= 6.20000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
51	.73439	8.9164E-03	.743217	1.000000	1.32797E-01	.5875273	.4328334	1.15867	1293.4887	518.7000	671.2822	33.7849
52	.76152	9.4872E-03	.727973	1.000000	1.35159E-01	.5676023	.4100383	1.13491	1266.9592	518.7000	666.1076	32.7796
53	.78986	1.0093E-02	.711968	1.000000	1.37359E-01	.5469779	.3871222	1.10996	1239.1047	518.7000	660.7514	31.7689
54	.81953	1.0735E-02	.695159	1.000000	1.39376E-01	.5256444	.3641320	1.08375	1209.8501	518.7000	655.2110	30.7550
55	.85060	1.1416E-02	.677499	1.000000	1.41189E-01	.5035948	.3411179	1.05622	1179.1138	518.7000	649.4847	29.7400
56	.88322	1.2138E-02	.658936	1.000000	1.42779E-01	.4809254	.3181333	1.02728	1146.8071	518.7000	643.5714	28.7264
57	.91750	1.2904E-02	.639415	1.000000	1.44107E-01	.4573364	.2952350	.99685	1112.8335	518.7000	637.4713	27.7165
58	.95361	1.3717E-02	.618876	1.000000	1.45155E-01	.4331329	.2724832	.96483	1077.0868	518.7000	631.1856	26.7131
59	.99173	1.4579E-02	.597250	1.000000	1.45887E-01	.4082256	.2499416	.93111	1039.4505	518.7000	624.7171	25.7190
60	1.03207	1.5493E-02	.574465	1.000000	1.46266E-01	.3826325	.2276774	.89559	999.7948	518.7000	618.0705	24.7371
61	1.07487	1.6463E-02	.550436	1.000000	1.46248E-01	.3563798	.2057615	.85813	957.9751	518.7000	611.2526	23.7705
62	1.12046	1.7491E-02	.525070	1.000000	1.45784E-01	.3295037	.1842689	.81858	913.8275	518.7000	604.2728	22.8226
63	1.16918	1.8582E-02	.498258	1.000000	1.44817E-01	.3020522	.1632785	.77678	867.1648	518.7000	597.1436	21.8969
64	1.22151	1.9739E-02	.469876	1.000000	1.43276E-01	.2740876	.1428739	.73254	817.7693	518.7000	589.8912	20.9970
65	1.27802	2.0966E-02	.439776	1.000000	1.41077E-01	.2456890	.1231438	.68561	765.3827	518.7000	582.5060	20.1269
66	1.33947	2.2268E-02	.407776	1.000000	1.38117E-01	.2169559	.1041833	.63572	709.6901	518.7000	575.0439	19.2907
67	1.40683	2.3648E-02	.373668	1.000000	1.34261E-01	.1880112	.0860950	.58252	650.2941	518.7000	567.5269	18.4930
68	1.48167	2.5112E-02	.337090	1.000000	1.29332E-01	.1590065	.0689917	.52552	586.6692	518.7000	559.9943	17.7387
69	1.56596	2.6665E-02	.297677	1.000000	1.23079E-01	.1301259	.0530000	.46008	518.0744	518.7000	552.4940	17.0334
70	1.66312	2.8312E-02	.254752	1.000000	1.15119E-01	.1015867	.0382669	.39716	443.3685	518.7000	545.0823	16.3836
71	1.77927	3.0059E-02	.207168	1.000000	1.04757E-01	.0736169	.0249729	.32297	360.5529	518.7000	537.8185	15.7974
72	1.92812	3.1912E-02	.152385	1.000000	9.02085E-02	.0462371	.0133516	.23757	265.2095	518.7000	530.7079	15.2848
73	2.17173	3.3878E-02	.077687	1.000000	5.60386E-02	.0150029	.0034341	.12111	135.2052	518.7000	522.5963	14.8475
74	4.03810	3.5962E-02	.005006	1.000000	1.22487E-02	.0004612	.0000142	.00780	8.7125	518.7000	518.8198	14.6966
75	5.34780	3.8173E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (49) X= 7.50000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
				** DIMENSIONLESS **				**		** DIMENSIONAL **		
1	.00000	.0	.954223	1.000000	5.30919E-02	.8920498	.8683781	1.48763	1660.7225	518.7000	750.3673	52.9933
2	.04059	3.0059E-05	.954223	1.000000	5.30919E-02	.8920498	.8683781	1.48763	1660.7225	518.7000	750.3673	52.9933
3	.05827	6.1942E-05	.952955	1.000000	5.39847E-02	.8899821	.8649565	1.48566	1658.5169	518.7000	749.8303	52.8424
4	.07248	9.5758E-05	.951377	1.000000	5.50777E-02	.8874122	.8607120	1.48320	1655.7705	518.7000	749.1629	52.6552
5	.08501	1.3162E-04	.949619	1.000000	5.62743E-02	.8845554	.8560031	1.48046	1652.7101	518.7000	748.4210	52.4475
6	.09656	1.6967E-04	.947722	1.000000	5.75427E-02	.8814813	.8509467	1.47750	1649.4078	518.7000	747.6227	52.2245
7	.10748	2.1001E-04	.945702	1.000000	5.88684E-02	.8782196	.8455938	1.47435	1645.8936	518.7000	746.7756	51.9885
8	.11799	2.5281E-04	.943569	1.000000	6.02435E-02	.8747849	.8399702	1.47102	1642.1814	518.7000	745.8836	51.7405
9	.12822	2.9820E-04	.941326	1.000000	6.16633E-02	.8711843	.8340899	1.46753	1638.2769	518.7000	744.9485	51.4811
10	.13827	3.4635E-04	.938973	1.000000	6.31246E-02	.8674210	.8279604	1.46386	1634.1820	518.7000	743.9712	51.2108
11	.14921	3.9741E-04	.936510	1.000000	6.46253E-02	.8634959	.8215856	1.46002	1629.8959	518.7000	742.9518	50.9297
12	.15810	4.5157E-04	.933936	1.000000	6.61635E-02	.8594084	.8149673	1.45601	1625.4161	518.7000	741.8903	50.6378
13	.16798	5.0901E-04	.931249	1.000000	6.77379E-02	.8551566	.8081055	1.45182	1620.7388	518.7000	740.7861	50.3352
14	.17788	5.6994E-04	.928405	1.000000	6.93474E-02	.8507381	.8009994	1.44745	1615.8595	518.7000	739.6386	50.0218
15	.18785	6.3457E-04	.925522	1.000000	7.09908E-02	.8461498	.7936476	1.44289	1610.7726	518.7000	738.4470	49.6975
16	.19791	7.0311E-04	.922477	1.000000	7.26672E-02	.8413880	.7860479	1.43814	1605.4722	518.7000	737.2104	49.3624
17	.20808	7.7581E-04	.919305	1.000000	7.43755E-02	.8364488	.7781980	1.43320	1599.9518	518.7000	735.9276	49.0162
18	.21838	8.5292E-04	.916002	1.000000	7.61149E-02	.8313275	.7700953	1.42805	1594.2040	518.7000	734.5976	48.6588
19	.22884	9.3470E-04	.912565	1.000000	7.78843E-02	.8260194	.7617370	1.42269	1588.2212	518.7000	733.2191	48.2902
20	.23948	1.0214E-03	.908987	1.000000	7.96827E-02	.8205194	.7531202	1.41711	1581.9953	518.7000	731.7907	47.9102
21	.25031	1.1134E-03	.905265	1.000000	8.15090E-02	.8148220	.7442019	1.41131	1575.5175	518.7000	730.3111	47.5186
22	.26135	1.2110E-03	.901393	1.000000	8.33621E-02	.8089213	.7350992	1.40527	1568.7786	518.7000	728.7787	47.1150
23	.27262	1.3145E-03	.897366	1.000000	8.52409E-02	.8028113	.7256891	1.39899	1561.7688	518.7000	727.1919	46.7004
24	.28414	1.4243E-03	.893176	1.000000	8.71439E-02	.7964855	.7160089	1.39246	1554.4778	518.7000	725.5491	46.2735
25	.29592	1.5408E-03	.888819	1.000000	8.90699E-02	.7899372	.7060556	1.38567	1546.8948	518.7000	723.8485	45.8345
26	.30798	1.6642E-03	.884288	1.000000	9.10173E-02	.7831593	.6958269	1.37860	1539.0083	518.7000	722.0882	45.3830
27	.32034	1.7952E-03	.879575	1.000000	9.29845E-02	.7761443	.6853201	1.37126	1530.8061	518.7000	720.2664	44.9201
28	.33302	1.9342E-03	.874674	1.000000	9.49697E-02	.7688847	.6745332	1.36362	1522.2757	518.7000	718.3911	44.4443
29	.34603	2.0815E-03	.869576	1.000000	9.69712E-02	.7613723	.6634641	1.35567	1513.4035	518.7000	716.4301	43.9562
30	.35940	2.2378E-03	.864273	1.000000	9.89869E-02	.7535987	.6521114	1.34740	1504.1754	518.7000	714.4113	43.4555
31	.37314	2.4036E-03	.858758	1.000000	1.01015E-01	.7455553	.6404736	1.33880	1494.5766	518.7000	712.3224	42.9422
32	.38726	2.5794E-03	.853021	1.000000	1.03052E-01	.7372329	.6285499	1.32986	1484.5914	518.7000	710.1610	42.4164
33	.40180	2.7659E-03	.847052	1.000000	1.05096E-01	.7286223	.6163399	1.32055	1474.2034	518.7000	707.9248	41.8779
34	.41678	2.9637E-03	.840842	1.000000	1.07145E-01	.7197137	.6038436	1.31087	1463.3950	518.7000	705.6113	41.3268
35	.43221	3.1735E-03	.834380	1.000000	1.09196E-01	.7104971	.5910616	1.30080	1452.1481	518.7000	703.2177	40.7631
36	.44811	3.3960E-03	.827654	1.000000	1.11244E-01	.7009621	.5779951	1.29031	1440.4433	518.7000	700.7414	40.1868
37	.46452	3.6320E-03	.820654	1.000000	1.13288E-01	.6910981	.5646460	1.27940	1428.2603	518.7000	698.1797	39.5981
38	.48146	3.8823E-03	.813367	1.000000	1.15322E-01	.6808942	.5510170	1.26804	1415.5776	518.7000	695.5297	38.9970
39	.49895	4.1478E-03	.805779	1.000000	1.17344E-01	.6703390	.5371113	1.25621	1402.3725	518.7000	692.7885	38.3837
40	.51703	4.4294E-03	.797878	1.000000	1.19336E-01	.6594212	.5229333	1.24389	1388.6212	518.7000	689.9532	37.7585
41	.53572	4.7281E-03	.789648	1.000000	1.21331E-01	.6481291	.5084881	1.23106	1374.2984	518.7000	687.0206	37.1219
42	.55506	5.0449E-03	.781075	1.000000	1.23287E-01	.6364508	.4937820	1.21770	1359.3775	518.7000	683.9877	36.4728
43	.57509	5.3809E-03	.772142	1.000000	1.25210E-01	.6243742	.4788223	1.20377	1343.8301	518.7000	680.8514	35.8131
44	.59583	5.7373E-03	.762832	1.000000	1.27095E-01	.6118874	.4636173	1.18925	1327.6265	518.7000	677.6085	35.1425
45	.61732	6.1153E-03	.753126	1.000000	1.28936E-01	.5989781	.4481769	1.17412	1310.7351	518.7000	674.2560	34.4615
46	.63962	6.5162E-03	.743006	1.000000	1.30726E-01	.5856343	.4325120	1.15835	1293.1224	518.7000	670.7905	33.7707
47	.66277	6.9415E-03	.732451	1.000000	1.32456E-01	.5718441	.4166350	1.14189	1274.7528	518.7000	667.2092	33.0705
48	.68681	7.3925E-03	.721440	1.000000	1.34120E-01	.5575957	.4005600	1.12472	1255.5886	518.7000	663.5089	32.3615
49	.71181	7.8709E-03	.709949	1.000000	1.35708E-01	.5428780	.3843024	1.10681	1235.5898	518.7000	659.6866	31.6445
50	.73781	8.3782E-03	.697954	1.000000	1.37211E-01	.5276799	.3678795	1.08811	1214.7137	518.7000	655.7397	30.9203

PROFILES-- STA (49) X= 7.50000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
51	.76489	8.9164E-03	.685428	1.000000	1.38619E-01	.5119914	.3513101	1.06858	1192.9148	518.7000	651.6653	30.1895
52	.79311	9.4872E-03	.672345	1.000000	1.39920E-01	.4959033	.3346152	1.04819	1170.1445	518.7000	647.4612	29.4532
53	.82256	1.0093E-02	.658674	1.000000	1.41102E-01	.4791072	.3178173	1.02687	1146.3508	518.7000	643.1252	28.7124
54	.85332	1.0735E-02	.644382	1.000000	1.42152E-01	.4618964	.3009412	1.00459	1121.4782	518.7000	638.6555	27.9681
55	.88548	1.1416E-02	.629436	1.000000	1.43054E-01	.4441656	.2840139	.98129	1095.4667	518.7000	634.0509	27.2216
56	.91917	1.2138E-02	.613799	1.000000	1.43792E-01	.4259116	.2670643	.95691	1068.2519	518.7000	629.3102	26.4741
57	.95448	1.2904E-02	.597431	1.000000	1.44348E-01	.4071336	.2501236	.93139	1039.7640	518.7000	624.4335	25.7270
58	.99158	1.3717E-02	.580287	1.000000	1.44702E-01	.3878335	.2332256	.90467	1009.9275	518.7000	619.4212	24.9817
59	1.03060	1.4579E-02	.562321	1.000000	1.44832E-01	.3680167	.2164065	.87666	978.6597	518.7000	614.2748	24.2400
60	1.07174	1.5493E-02	.543481	1.000000	1.44712E-01	.3476927	.1997047	.84729	945.8703	518.7000	608.9966	23.5034
61	1.11521	1.6463E-02	.523709	1.000000	1.44313E-01	.3268755	.1831619	.81646	911.4596	518.7000	603.5903	22.7738
62	1.16126	1.7491E-02	.502942	1.000000	1.43603E-01	.3055850	.1668223	.78409	875.3167	518.7000	598.0611	22.0532
63	1.21017	1.8582E-02	.481108	1.000000	1.42545E-01	.2838474	.1507333	.75005	837.3174	518.7000	592.4158	21.3437
64	1.26231	1.9739E-02	.458127	1.000000	1.41094E-01	.2616969	.1349456	.71422	797.3207	518.7000	586.6633	20.6474
65	1.31811	2.0966E-02	.433905	1.000000	1.39198E-01	.2391767	.1195137	.67646	755.1647	518.7000	580.8147	19.9668
66	1.37811	2.2268E-02	.408333	1.000000	1.36797E-01	.2163412	.1044966	.63659	710.6603	518.7000	574.8843	19.3045
67	1.44300	2.3648E-02	.381283	1.000000	1.33814E-01	.1932571	.0899581	.59442	663.5814	518.7000	568.8893	18.6633
68	1.51369	2.5112E-02	.352594	1.000000	1.30154E-01	.1700065	.0759665	.54969	613.6513	518.7000	562.8511	18.0464
69	1.59139	2.6665E-02	.322064	1.000000	1.25691E-01	.1466889	.0626053	.50210	560.5181	518.7000	556.7954	17.4570
70	1.67781	2.8312E-02	.289424	1.000000	1.20258E-01	.1234242	.0499563	.45121	503.7117	518.7000	550.7535	16.8992
71	1.77554	3.0059E-02	.254287	1.000000	1.13612E-01	.1003536	.0381218	.39643	442.5590	518.7000	544.7620	16.3773
72	1.88874	3.1912E-02	.216037	1.000000	1.05372E-01	.0776367	.0272188	.33680	375.9899	518.7000	538.8624	15.8964
73	2.02519	3.3878E-02	.173529	1.000000	9.48403E-02	.0554221	.0173862	.27053	302.0085	518.7000	533.0932	15.4628
74	2.20349	3.5962E-02	.123910	1.000000	8.01592E-02	.0336148	.0087860	.19318	215.6523	518.7000	527.4298	15.0835
75	2.53379	3.8173E-02	.052646	1.000000	4.34172E-02	.0081796	.0015739	.08207	91.6243	518.7000	520.8243	14.7654
76	6.20473	4.0518E-02	.001984	1.000000	7.58167E-03	.0001712	.0000022	.00309	3.4521	518.7000	518.7445	14.6961
77	8.51602	4.3006E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (51) X= 9.00000 PRESSURE= 14.6960

				** DIMENSIONLESS	**			**	** DIMENSIONAL	**	
N	Y	PSI*	UD	THD	TI	TTO	PTD	MACH	U	T	TOT	PTOT*
1	.00000	.0	.840127	1.000000	9.04970E-02	.7089657	.6024188	1.30976	1462.1511	518.7000	702.8200	41.2639
2	.03326	3.0059E-05	.840127	1.000000	9.04970E-02	.7089657	.6024188	1.30976	1462.1511	518.7000	702.8200	41.2639
3	.05210	6.1942E-05	.839269	1.000000	9.09617E-02	.7078130	.6007127	1.30842	1460.6584	518.7000	702.5206	41.1887
4	.07723	9.5758E-05	.838123	1.000000	9.15368E-02	.7063669	.5985783	1.30674	1458.7859	518.7000	702.1451	41.0946
5	.09059	1.3162E-04	.836985	1.000000	9.21732E-02	.7047431	.5961891	1.30486	1456.6836	518.7000	701.7234	40.9892
6	.10288	1.6967E-04	.835672	1.000000	9.28543E-02	.7029778	.5936005	1.30281	1454.3979	518.7000	701.2649	40.8750
7	.11450	2.1001E-04	.834264	1.000000	9.35727E-02	.7010852	.5908353	1.30062	1451.9472	518.7000	700.7734	40.7531
8	.12568	2.5281E-04	.832765	1.000000	9.43242E-02	.6990715	.5879039	1.29828	1449.3390	518.7000	700.2504	40.6238
9	.13656	2.9820E-04	.831178	1.000000	9.51063E-02	.6969384	.5848110	1.29581	1446.5756	518.7000	699.6965	40.4870
10	.14724	3.4635E-04	.829500	1.000000	9.59173E-02	.6946857	.5815583	1.29319	1443.6564	518.7000	699.1114	40.3439
11	.15781	3.9741E-04	.827732	1.000000	9.67560E-02	.6923119	.5781453	1.29043	1440.5791	518.7000	698.4949	40.1934
12	.16831	4.5157E-04	.825871	1.000000	9.76212E-02	.6898144	.5745708	1.28753	1437.3402	518.7000	697.8464	40.0358
13	.17880	5.0901E-04	.823915	1.000000	9.85122E-02	.6871903	.5708325	1.28448	1433.9353	518.7000	697.1649	39.8709
14	.18932	5.6994E-04	.821850	1.000000	9.94282E-02	.6844360	.5669279	1.28128	1430.3594	518.7000	696.4496	39.6987
15	.19930	6.3457E-04	.819704	1.000000	1.00369E-01	.6815476	.5628540	1.27792	1426.6070	518.7000	695.6994	39.5191
16	.21057	7.0311E-04	.817443	1.000000	1.01332E-01	.6785209	.5586076	1.27439	1422.6722	518.7000	694.9134	39.3318
17	.22135	7.7581E-04	.815074	1.000000	1.02319E-01	.6753514	.5541853	1.27070	1418.5484	518.7000	694.0903	39.1367
18	.23228	8.5292E-04	.812592	1.000000	1.03328E-01	.6720343	.5495835	1.26683	1414.2289	518.7000	693.2288	38.9338
19	.24336	9.3470E-04	.809923	1.000000	1.04358E-01	.6685647	.5447988	1.26278	1409.7065	518.7000	692.3278	38.7228
20	.25463	1.0214E-03	.807274	1.000000	1.05409E-01	.6649375	.5398276	1.25854	1404.9735	518.7000	691.3858	38.5035
21	.26609	1.1134E-03	.804429	1.000000	1.06480E-01	.6611473	.5346662	1.25410	1400.0221	518.7000	690.4014	38.2759
22	.27778	1.2110E-03	.801453	1.000000	1.07570E-01	.6571886	.5293111	1.24947	1394.8439	518.7000	689.3733	38.0397
23	.28970	1.3145E-03	.798343	1.000000	1.08677E-01	.6530555	.5237588	1.24462	1389.4301	518.7000	688.3000	37.7949
24	.30188	1.4243E-03	.795092	1.000000	1.09802E-01	.6487421	.5180059	1.23955	1383.7717	518.7000	687.1798	37.5412
25	.31434	1.5408E-03	.791694	1.000000	1.10942E-01	.6442424	.5120489	1.23425	1377.8591	518.7000	686.0112	37.2784
26	.32708	1.6642E-03	.788145	1.000000	1.12097E-01	.6395500	.5058847	1.22872	1371.6824	518.7000	684.7926	37.0066
27	.34014	1.7952E-03	.784439	1.000000	1.13265E-01	.6346585	.4995103	1.22294	1365.2312	518.7000	683.5222	36.7255
28	.35353	1.9342E-03	.780568	1.000000	1.14445E-01	.6295611	.4929227	1.21691	1358.4946	518.7000	682.1984	36.4349
29	.36726	2.0815E-03	.776527	1.000000	1.15636E-01	.6242511	.4861193	1.21060	1351.4614	518.7000	680.8194	36.1349
30	.38136	2.2378E-03	.772308	1.000000	1.16836E-01	.6187214	.4790974	1.20403	1344.1195	518.7000	679.3833	35.8252
31	.39584	2.4036E-03	.767905	1.000000	1.18044E-01	.6129648	.4718550	1.19716	1336.4567	518.7000	677.8883	35.5058
32	.41073	2.5794E-03	.763310	1.000000	1.19257E-01	.6069740	.4643900	1.19000	1328.4601	518.7000	676.3325	35.1766
33	.42605	2.7659E-03	.758516	1.000000	1.20475E-01	.6007414	.4567009	1.18253	1320.1160	518.7000	674.7139	34.8375
34	.44191	2.9637E-03	.753514	1.000000	1.21693E-01	.5942594	.4487862	1.17473	1311.4103	518.7000	673.0305	34.4884
35	.45805	3.1735E-03	.748296	1.000000	1.22912E-01	.5875201	.4406450	1.16659	1302.3282	518.7000	671.2803	34.1294
36	.47478	3.3960E-03	.742852	1.000000	1.24128E-01	.5805155	.4322768	1.15811	1292.8541	518.7000	669.4612	33.7603
37	.49203	3.6320E-03	.737174	1.000000	1.25338E-01	.5732376	.4236814	1.14925	1282.9719	518.7000	667.5711	33.3812
38	.50983	3.8823E-03	.731251	1.000000	1.26541E-01	.5656780	.4148593	1.14002	1272.6643	518.7000	665.6078	32.9922
39	.52820	4.1478E-03	.725074	1.000000	1.27733E-01	.5578284	.4058112	1.13039	1261.9137	518.7000	663.5693	32.5931
40	.54717	4.4294E-03	.718632	1.000000	1.28911E-01	.5496803	.3965386	1.12035	1250.7012	518.7000	661.4532	32.1842
41	.56678	4.7281E-03	.711912	1.000000	1.30072E-01	.5412253	.3870435	1.10987	1239.0070	518.7000	659.2574	31.7654
42	.58705	5.0449E-03	.704904	1.000000	1.31211E-01	.5324548	.3773286	1.09895	1226.8105	518.7000	656.9707	31.3370
43	.60801	5.3809E-03	.697595	1.000000	1.32326E-01	.5233601	.3673972	1.08755	1214.0899	518.7000	654.6178	30.8990
44	.62972	5.7373E-03	.689972	1.000000	1.33412E-01	.5139326	.3572533	1.07567	1200.8222	518.7000	652.1695	30.4516
45	.65220	6.1153E-03	.682020	1.000000	1.34465E-01	.5041640	.3469017	1.06327	1186.9833	518.7000	649.6325	29.9951
46	.67550	6.5162E-03	.673726	1.000000	1.35479E-01	.4940456	.3363482	1.05034	1172.5477	518.7000	647.0047	29.5297
47	.69965	6.9415E-03	.665073	1.000000	1.36449E-01	.4835692	.3255993	1.03685	1157.4885	518.7000	644.2840	29.0556
48	.72472	7.3925E-03	.656046	1.000000	1.37370E-01	.4727267	.3146624	1.02278	1141.7773	518.7000	641.0682	28.5733
49	.75076	7.8709E-03	.646626	1.000000	1.38234E-01	.4615104	.3035461	1.00809	1125.3840	518.7000	638.5553	28.0830
50	.77781	8.3782E-03	.636797	1.000000	1.39037E-01	.4499127	.2922597	.99277	1108.2767	518.7000	635.5433	27.5853

PROFILES-- STA (51) X= 9.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	TI (** DIMENSIONLESS **)	TID	PTD	MACH **	U	T (** DIMENSIONAL **)	TOT	PTOT *
51	.80594	8.9164E-03	.626538	1.000000	1.39769E-01	.4379267	.2808140	.97677	1090.4218	518.7000	632.4305	27.0805
52	.83523	9.4972E-03	.615828	1.000000	1.40424E-01	.4255458	.2692207	.96008	1071.7831	518.7000	629.2152	26.5692
53	.86573	1.0093E-02	.604647	1.000000	1.40992E-01	.4127645	.2574928	.94264	1052.3227	518.7000	625.8959	26.0520
54	.89754	1.0735E-02	.592969	1.000000	1.41463E-01	.3995777	.2456446	.92444	1031.9998	518.7000	622.4712	25.5294
55	.93074	1.1416E-02	.580772	1.000000	1.41828E-01	.3859615	.2336918	.90542	1010.7709	518.7000	618.9403	25.0023
56	.96542	1.2138E-02	.568027	1.000000	1.42075E-01	.3719732	.2216515	.88555	988.5895	518.7000	615.3023	24.4713
57	1.00171	1.2904E-02	.554706	1.000000	1.42190E-01	.3575515	.2095422	.86479	965.4055	518.7000	611.5569	23.9373
58	1.03973	1.3717E-02	.540777	1.000000	1.42161E-01	.3427166	.1973843	.84307	941.1652	518.7000	607.7043	23.4011
59	1.07960	1.4579E-02	.526209	1.000000	1.41971E-01	.3274710	.1851995	.82036	915.8105	518.7000	603.7450	22.8637
60	1.12149	1.5493E-02	.510964	1.000000	1.41603E-01	.3118192	.1730115	.79659	889.2782	518.7000	599.6802	22.3262
61	1.16559	1.6463E-02	.495003	1.000000	1.41038E-01	.2957686	.1608458	.77171	861.4997	518.7000	595.5118	21.7896
62	1.21208	1.7491E-02	.478283	1.000000	1.40254E-01	.2793294	.1487299	.74564	832.3996	518.7000	591.2425	21.2553
63	1.26122	1.8582E-02	.460755	1.000000	1.39225E-01	.2625159	.1366934	.71832	801.8949	518.7000	586.8760	20.7245
64	1.31327	1.9739E-02	.442367	1.000000	1.37924E-01	.2453464	.1247684	.68965	769.8931	518.7000	582.4170	20.1986
65	1.36861	2.0966E-02	.423060	1.000000	1.36318E-01	.2278444	.1129893	.65955	736.2907	518.7000	577.8717	19.6791
66	1.42760	2.2268E-02	.402766	1.000000	1.34368E-01	.2100390	.1013935	.62791	700.9702	518.7000	573.2476	19.1677
67	1.49074	2.3648E-02	.381406	1.000000	1.32029E-01	.1919663	.0900215	.59461	663.7962	518.7000	568.5541	18.6661
68	1.55864	2.5112E-02	.358890	1.000000	1.29247E-01	.1736703	.0789173	.55951	624.6105	518.7000	563.8026	18.1764
69	1.63208	2.6665E-02	.335110	1.000000	1.25955E-01	.1552044	.0681293	.52244	583.2235	518.7000	559.0069	17.7006
70	1.71207	2.8312E-02	.309931	1.000000	1.22069E-01	.1366327	.0577111	.48318	539.4026	518.7000	554.1838	17.2412
71	1.79997	3.0059E-02	.283183	1.000000	1.17480E-01	.1180319	.0477225	.44148	492.8503	518.7000	549.3532	16.8007
72	1.89770	3.1912E-02	.254637	1.000000	1.12039E-01	.0994929	.0382310	.39698	443.1686	518.7000	544.5385	16.3821
73	2.00812	3.3878E-02	.223964	1.000000	1.05533E-01	.0811210	.0293144	.34916	389.7846	518.7000	539.7673	15.9888
74	2.13584	3.5962E-02	.190640	1.000000	9.76266E-02	.0630322	.0210633	.29721	331.7879	518.7000	535.0696	15.6249
75	2.28938	3.8173E-02	.153693	1.000000	8.77024E-02	.0453272	.0135850	.23961	267.4855	518.7000	530.4716	15.2951
76	2.48877	4.0518E-02	.110730	1.000000	7.41183E-02	.0278989	.0070032	.17263	192.7136	518.7000	525.9454	15.0049
77	2.80274	4.3006E-02	.050036	1.000000	4.23833E-02	.0076612	.0014215	.07801	87.0817	518.7000	520.6896	14.7587
78	6.30321	4.5644E-02	.002279	1.000000	8.28158E-03	.0002048	.0000029	.00355	3.9661	518.7000	518.7532	14.6961
79	8.56149	4.8442E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (53) X= 11.00000 PRESSURE= 14.6960

			** DIMENSIONLESS **				**		** DIMENSIONAL **		
N	Y	PSI *	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT *
1	.00000	.0	.699853	1.000000	1.09446E-01	.5103135	.3704432	1.09107	1218.0191	518.7000	651.2296	31.0333
2	.06385	5.4558E-05	.699853	1.000000	1.09446E-01	.5103135	.3704432	1.09107	1218.0191	518.7000	651.2296	31.0333
3	.09167	1.1242E-04	.699034	1.000000	1.09716E-01	.5093736	.3693355	1.08979	1216.5931	518.7000	650.9855	30.9845
4	.11401	1.7380E-04	.698002	1.000000	1.10053E-01	.5081896	.3679441	1.08818	1214.7972	518.7000	650.6780	30.9231
5	.13371	2.3890E-04	.696838	1.000000	1.10427E-01	.5068542	.3663798	1.08637	1212.7719	518.7000	650.3312	30.8541
6	.15188	3.0794E-04	.695567	1.000000	1.10830E-01	.5053957	.3646769	1.08439	1210.5598	518.7000	649.9524	30.7790
7	.16905	3.8118E-04	.694198	1.000000	1.11257E-01	.5038246	.3628492	1.08225	1208.1765	518.7000	649.5444	30.6984
8	.18557	4.5985E-04	.692733	1.000000	1.11706E-01	.5021445	.3609021	1.07997	1205.6274	518.7000	649.1081	30.6125
9	.20165	5.4123E-04	.691173	1.000000	1.12176E-01	.5003559	.3588374	1.07754	1202.9130	518.7000	648.6435	30.5215
10	.21740	6.2861E-04	.689517	1.000000	1.12666E-01	.4984573	.3566550	1.07496	1200.0308	518.7000	648.1505	30.4252
11	.23305	7.2129E-04	.687762	1.000000	1.13176E-01	.4964462	.3543536	1.07222	1196.9768	518.7000	647.6282	30.3237
12	.24860	8.1959E-04	.685906	1.000000	1.13703E-01	.4943194	.3519309	1.06933	1193.7454	518.7000	647.0759	30.2169
13	.26413	9.2386E-04	.683944	1.000000	1.14250E-01	.4920729	.3493843	1.06627	1190.3307	518.7000	646.4924	30.1046
14	.27970	1.0344E-03	.681872	1.000000	1.14813E-01	.4897026	.3467110	1.06304	1186.7255	518.7000	645.8769	29.9867
15	.29537	1.1517E-03	.679687	1.000000	1.15394E-01	.4872037	.3439078	1.05963	1182.9223	518.7000	645.2279	29.8631
16	.31118	1.2761E-03	.677383	1.000000	1.15991E-01	.4845714	.3409714	1.05604	1178.9131	518.7000	644.5443	29.7336
17	.32716	1.4081E-03	.674956	1.000000	1.16603E-01	.4818005	.3378983	1.05226	1174.6892	518.7000	643.8247	29.5980
18	.34337	1.5480E-03	.672401	1.000000	1.17231E-01	.4788855	.3346850	1.04827	1170.2416	518.7000	643.0676	29.4563
19	.35982	1.6965E-03	.669711	1.000000	1.17872E-01	.4758207	.3313282	1.04408	1165.5606	518.7000	642.2717	29.3083
20	.37655	1.8539E-03	.666882	1.000000	1.18527E-01	.4726004	.3278243	1.03967	1160.6362	518.7000	641.4354	29.1537
21	.39359	2.0209E-03	.663906	1.000000	1.19193E-01	.4692182	.3241699	1.03503	1155.4579	518.7000	640.5570	28.9926
22	.41097	2.1980E-03	.660779	1.000000	1.19870E-01	.4656681	.3203616	1.03015	1150.0147	518.7000	639.6351	28.8246
23	.42872	2.3859E-03	.657492	1.000000	1.20557E-01	.4619436	.3163962	1.02503	1144.2950	518.7000	638.6678	28.6497
24	.44687	2.5851E-03	.654040	1.000000	1.21252E-01	.4580379	.3122705	1.01965	1138.2869	518.7000	637.6535	28.4678
25	.46544	2.7964E-03	.650415	1.000000	1.21953E-01	.4539443	.3079815	1.01400	1131.9778	518.7000	636.5904	28.2786
26	.48447	3.0206E-03	.646610	1.000000	1.22659E-01	.4496558	.3035264	1.00806	1125.3546	518.7000	635.4766	28.0822
27	.50398	3.2583E-03	.642616	1.000000	1.23367E-01	.4451653	.2989025	1.00184	1118.4036	518.7000	634.3104	27.8782
28	.52401	3.5105E-03	.638425	1.000000	1.24076E-01	.4404655	.2941074	.99530	1111.1106	518.7000	633.0899	27.6668
29	.54458	3.7779E-03	.634030	1.000000	1.24784E-01	.4355490	.2891391	.98845	1103.4605	518.7000	631.8131	27.4476
30	.56573	4.0614E-03	.629420	1.000000	1.25487E-01	.4304084	.2839955	.98127	1095.4378	518.7000	630.4780	27.2208
31	.58749	4.3625E-03	.624587	1.000000	1.26184E-01	.4250360	.2786751	.97373	1087.0263	518.7000	629.0828	26.9862
32	.60990	4.6816E-03	.619520	1.000000	1.26871E-01	.4194241	.2731771	.96583	1078.2088	518.7000	627.6254	26.7437
33	.63299	5.0201E-03	.614211	1.000000	1.27546E-01	.4135649	.2675003	.95755	1068.9676	518.7000	626.1037	26.4933
34	.65679	5.3791E-03	.608647	1.000000	1.28204E-01	.4074509	.2616445	.94888	1059.2840	518.7000	624.5159	26.2351
35	.68135	5.7599E-03	.602817	1.000000	1.28843E-01	.4010741	.2556097	.93979	1049.1385	518.7000	622.8598	25.9689
36	.70673	6.1637E-03	.596710	1.000000	1.29458E-01	.3944268	.2493966	.93027	1038.5106	518.7000	621.1335	25.6949
37	.73295	6.5921E-03	.590314	1.000000	1.30046E-01	.3875013	.2430063	.92030	1027.3788	518.7000	619.3350	25.4131
38	.76006	7.0464E-03	.583616	1.000000	1.30602E-01	.3802901	.2364406	.90986	1015.7206	518.7000	617.4622	25.1235
39	.78812	7.5283E-03	.576601	1.000000	1.31121E-01	.3727857	.2297019	.89892	1003.5123	518.7000	615.5133	24.8263
40	.81719	8.0394E-03	.569256	1.000000	1.31598E-01	.3649810	.2227933	.88747	990.7291	518.7000	613.4864	24.5217
41	.84731	8.5815E-03	.561566	1.000000	1.32027E-01	.3568690	.2157184	.87548	977.3446	518.7000	611.3797	24.2096
42	.87856	9.1565E-03	.553514	1.000000	1.32403E-01	.3484430	.2084820	.86293	963.3313	518.7000	609.1914	23.8905
43	.91101	9.7663E-03	.545084	1.000000	1.32718E-01	.3396970	.2010895	.84979	948.6600	518.7000	606.9201	23.5645
44	.94472	1.0413E-02	.536258	1.000000	1.32966E-01	.3306253	.1935471	.83603	933.2999	518.7000	604.5641	23.2318
45	.97979	1.1099E-02	.527018	1.000000	1.33140E-01	.3212227	.1858621	.82162	917.2184	518.7000	602.1222	22.8929
46	1.01630	1.1827E-02	.517343	1.000000	1.33229E-01	.3114850	.1780429	.80654	900.3808	518.7000	599.5933	22.5481
47	1.05436	1.2599E-02	.507213	1.000000	1.33227E-01	.3014086	.1700987	.79075	882.7503	518.7000	596.9765	22.1977
48	1.09406	1.3417E-02	.496605	1.000000	1.33123E-01	.2909912	.1620400	.77421	864.2878	518.7000	594.2711	21.8423
49	1.13554	1.4286E-02	.485495	1.000000	1.32906E-01	.2802313	.1538785	.75689	844.9514	518.7000	591.4767	21.4824
50	1.17893	1.5206E-02	.473856	1.000000	1.32564E-01	.2691290	.1456271	.73874	824.6961	518.7000	588.5934	21.1185

PROFILES-- STA (53) X= 11.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **						**	** DIMENSIONAL **		
51	1.22437	1.6183E-02	.461662	1.000000	1.32084E-01	.2576860	.1373002	.71973	803.4738	518.7000	585.6216	20.7512
52	1.27205	1.7219E-02	.448883	1.000000	1.31451E-01	.2459057	.1289133	.69981	781.2322	518.7000	582.5623	20.3814
53	1.32215	1.8318E-02	.435485	1.000000	1.30651E-01	.2337935	.1204839	.67892	757.9149	518.7000	579.4167	20.0096
54	1.37491	1.9483E-02	.421434	1.000000	1.29664E-01	.2213576	.1120308	.65701	733.4600	518.7000	576.1871	19.6368
55	1.43058	2.0720E-02	.406690	1.000000	1.28470E-01	.2086086	.1035745	.63403	707.7998	518.7000	572.8761	19.2639
56	1.49946	2.2031E-02	.391210	1.000000	1.27047E-01	.1955605	.0951377	.60990	680.8591	518.7000	569.4875	18.8918
57	1.55190	2.3421E-02	.374946	1.000000	1.25368E-01	.1822312	.0867448	.58454	652.5541	518.7000	566.0259	18.5216
58	1.61834	2.4896E-02	.357845	1.000000	1.23402E-01	.1686428	.0784228	.55788	622.7902	518.7000	562.4969	18.1546
59	1.68929	2.6461E-02	.339842	1.000000	1.21115E-01	.1548225	.0702012	.52981	591.4591	518.7000	558.9077	17.7920
60	1.76539	2.8120E-02	.320867	1.000000	1.18464E-01	.1408035	.0621122	.50023	558.4353	518.7000	555.2670	17.4353
61	1.84742	2.9880E-02	.300834	1.000000	1.15397E-01	.1266257	.0541919	.46900	523.5701	518.7000	551.5850	17.0860
62	1.93643	3.1746E-02	.279640	1.000000	1.11851E-01	.1123370	.0464799	.43596	486.6836	518.7000	547.8742	16.7459
63	2.03376	3.3726E-02	.257155	1.000000	1.07743E-01	.0979942	.0390210	.40090	447.5503	518.7000	544.1493	16.4169
64	2.14130	3.5826E-02	.233210	1.000000	1.02964E-01	.0836640	.0318660	.36357	405.8764	518.7000	540.4277	16.1014
65	2.26173	3.8053E-02	.207572	1.000000	9.73560E-02	.0694236	.0250731	.32361	361.2574	518.7000	536.7295	15.8018
66	2.39924	4.0415E-02	.179900	1.000000	9.06793E-02	.0553597	.0187117	.28046	313.0958	518.7000	533.0770	15.5212
67	2.56074	4.2921E-02	.149626	1.000000	8.25115E-02	.0415571	.0128661	.23327	260.4084	518.7000	529.4925	15.2634
68	2.76112	4.5578E-02	.115624	1.000000	7.19196E-02	.0280392	.0076410	.18026	201.2309	518.7000	525.9818	15.0330
69	3.04273	4.8397E-02	.073926	1.000000	5.50979E-02	.0141450	.0031086	.11525	128.6597	518.7000	522.3735	14.8331
70	3.98658	5.1387E-02	.014016	1.000000	1.86682E-02	.0012055	.0001114	.02185	24.3939	518.7000	519.0131	14.7009
71	31.20328	5.4558E-02	.000087	1.000000	1.45382E-03	.0000062	.0000000	.00014	.1516	518.7000	518.7016	14.6960
72	44.60357	5.7921E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (55) X= 12.12730 PRESSURE= 14.6960

			** DIMENSIONLESS **					**		** DIMENSIONAL **		
N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
1	.00000	.0	.638392	1.000000	1.09732E-01	.4306577	.2940695	.99525	1111.0526	518.7000	630.5428	27.6651
2	.06685	5.4558E-05	.638392	1.000000	1.09732E-01	.4306577	.2940695	.99525	1111.0526	518.7000	630.5428	27.6651
3	.09598	1.1292E-04	.637763	1.000000	1.09901E-01	.4299868	.2933551	.99427	1109.9582	518.7000	630.3685	27.6336
4	.11936	1.7380E-04	.636970	1.000000	1.10111E-01	.4291404	.2924556	.99304	1108.5779	518.7000	630.1487	27.5939
5	.13999	2.3890E-04	.636074	1.000000	1.10347E-01	.4281844	.2914420	.99164	1107.0185	518.7000	629.9004	27.5492
6	.15809	3.0724E-04	.635093	1.000000	1.10601E-01	.4271382	.2903357	.99011	1105.3118	518.7000	629.6288	27.5004
7	.17695	3.8118E-04	.634035	1.000000	1.10873E-01	.4260091	.2891548	.98846	1103.4694	518.7000	629.3355	27.4479
8	.19423	4.5885E-04	.632900	1.000000	1.11160E-01	.4247992	.2878724	.98669	1101.4947	518.7000	629.0213	27.3918
9	.21104	5.4123E-04	.631689	1.000000	1.11461E-01	.4235084	.2865191	.98480	1099.3872	518.7000	628.6861	27.3321
10	.22755	6.2861E-04	.630400	1.000000	1.11778E-01	.4221353	.2850839	.98279	1097.1443	518.7000	628.3295	27.2688
11	.24388	7.2129E-04	.629032	1.000000	1.12108E-01	.4206774	.2835653	.98066	1094.7619	518.7000	627.9509	27.2018
12	.26011	8.1959E-04	.627580	1.000000	1.12453E-01	.4191320	.2819612	.97840	1092.2352	518.7000	627.5495	27.1311
13	.27633	9.2386E-04	.626042	1.000000	1.12812E-01	.4174957	.2802691	.97600	1089.5584	518.7000	627.1246	27.0565
14	.29259	1.0344E-03	.624414	1.000000	1.13184E-01	.4157649	.2784862	.97346	1086.7252	518.7000	626.6751	26.9778
15	.30894	1.1517E-03	.622692	1.000000	1.13570E-01	.4139356	.2766097	.97078	1083.7287	518.7000	626.2000	26.8951
16	.32543	1.2761E-03	.620872	1.000000	1.13970E-01	.4120036	.2746364	.96794	1080.5616	518.7000	625.6983	26.8080
17	.34211	1.4081E-03	.618950	1.000000	1.14382E-01	.4099645	.2725631	.96494	1077.2161	518.7000	625.1687	26.7166
18	.35900	1.5480E-03	.616920	1.000000	1.14808E-01	.4078136	.2703866	.96178	1073.6838	518.7000	624.6101	26.6206
19	.37615	1.6965E-03	.614779	1.000000	1.15245E-01	.4055460	.2681035	.95844	1069.9563	518.7000	624.0212	26.5199
20	.39358	1.8539E-03	.612519	1.000000	1.15695E-01	.4031567	.2657104	.95492	1066.0242	518.7000	623.4007	26.4144
21	.41133	2.0209E-03	.610137	1.000000	1.16155E-01	.4006404	.2632039	.95120	1061.8780	518.7000	622.7472	26.3038
22	.42942	2.1980E-03	.607626	1.000000	1.16626E-01	.3979916	.2605806	.94729	1057.5078	518.7000	622.0593	26.1882
23	.44789	2.3859E-03	.604980	1.000000	1.17107E-01	.3952046	.2578370	.94316	1052.9030	518.7000	621.3355	26.0672
24	.46676	2.5851E-03	.602193	1.000000	1.17597E-01	.3922737	.2549690	.93882	1048.0528	518.7000	620.5744	25.9407
25	.48607	2.7964E-03	.599259	1.000000	1.18094E-01	.3891928	.2519758	.93424	1042.9455	518.7000	619.7742	25.8087
26	.50584	3.0206E-03	.596170	1.000000	1.18598E-01	.3859558	.2488517	.92943	1037.5694	518.7000	618.9336	25.6709
27	.52611	3.2583E-03	.592919	1.000000	1.19108E-01	.3825562	.2455942	.92436	1031.9118	518.7000	618.0507	25.5272
28	.54690	3.5105E-03	.589499	1.000000	1.19621E-01	.3789877	.2422003	.91903	1025.9599	518.7000	617.1240	25.3775
29	.56824	3.7779E-03	.585902	1.000000	1.20136E-01	.3752435	.2386673	.91342	1019.6999	518.7000	616.1516	25.2217
30	.59017	4.0616E-03	.582120	1.000000	1.20651E-01	.3713170	.2349923	.90753	1013.1178	518.7000	615.1318	25.0597
31	.61271	4.3625E-03	.578144	1.000000	1.21165E-01	.3672011	.2311728	.90133	1006.1985	518.7000	614.0629	24.8912
32	.63592	4.6816E-03	.573966	1.000000	1.21674E-01	.3628888	.2272064	.89481	998.9267	518.7000	612.9430	24.7163
33	.65981	5.0201E-03	.569576	1.000000	1.22178E-01	.3583731	.2230912	.88797	991.2861	518.7000	611.7703	24.5348
34	.68443	5.3791E-03	.564964	1.000000	1.22672E-01	.3536466	.2188253	.88078	983.2599	518.7000	610.5428	24.3467
35	.70982	5.7599E-03	.560121	1.000000	1.23154E-01	.3487022	.2144072	.87323	974.8302	518.7000	609.2588	24.1518
36	.73602	6.1637E-03	.555035	1.000000	1.23621E-01	.3435326	.2098359	.86530	965.9787	518.7000	607.9162	23.9502
37	.76307	6.5921E-03	.549695	1.000000	1.24070E-01	.3381304	.2051104	.85697	956.6857	518.7000	606.5132	23.7418
38	.79103	7.0464E-03	.544090	1.000000	1.24496E-01	.3324883	.2002305	.84824	946.9311	518.7000	605.0479	23.5266
39	.81993	7.5283E-03	.538208	1.000000	1.24896E-01	.3265991	.1951963	.83907	936.6935	518.7000	603.5185	23.3046
40	.84985	8.0374E-03	.532035	1.000000	1.25266E-01	.3204556	.1900084	.82944	925.9505	518.7000	601.9230	23.0758
41	.88083	8.5815E-03	.525559	1.000000	1.25600E-01	.3140509	.1846679	.81935	914.6786	518.7000	600.2597	22.8402
42	.91293	9.1565E-03	.518764	1.000000	1.25894E-01	.3073782	.1791766	.80875	902.8530	518.7000	598.5268	22.5981
43	.94623	9.7663E-03	.511636	1.000000	1.26141E-01	.3004309	.1735369	.79764	890.4478	518.7000	596.7226	22.3493
44	.98072	1.0413E-02	.504159	1.000000	1.26337E-01	.2932029	.1677518	.78598	877.4356	518.7000	594.8454	22.0942
45	1.01670	1.1099E-02	.496317	1.000000	1.26475E-01	.2856883	.1618251	.77376	863.7872	518.7000	592.8939	21.8328
46	1.05404	1.1827E-02	.488092	1.000000	1.26547E-01	.2778817	.1557615	.76094	849.4722	518.7000	590.8665	21.5654
47	1.09290	1.2599E-02	.479465	1.000000	1.26545E-01	.2697786	.1495663	.74749	834.4580	518.7000	588.7621	21.2922
48	1.13340	1.3417E-02	.470417	1.000000	1.26463E-01	.2613749	.1432459	.73338	818.7104	518.7000	586.5796	21.0134
49	1.17563	1.4286E-02	.460926	1.000000	1.26290E-01	.2526674	.1368077	.71858	802.1925	518.7000	584.3183	20.7295
50	1.21973	1.5206E-02	.450970	1.000000	1.26016E-01	.2436539	.1302600	.70306	784.8655	518.7000	581.9775	20.4407

PROFILES-- STA (55) X= 12.12730 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT *
51	1.26589	1.6183E-02	.440526	1.000000	1.25631E-01	.2343335	.1236124	.68678	766.6876	518.7000	579.5569	20.1476
52	1.31412	1.7219E-02	.429566	1.000000	1.25123E-01	.2247063	.1168756	.66969	747.6139	518.7000	577.0567	19.8505
53	1.36474	1.8318E-02	.418064	1.000000	1.24478E-01	.2147743	.1100615	.65176	727.5962	518.7000	574.4774	19.5499
54	1.41791	1.9483E-02	.405990	1.000000	1.23682E-01	.2045410	.1031836	.63294	706.5824	518.7000	571.8198	19.2466
55	1.47386	2.0720E-02	.393311	1.000000	1.22719E-01	.1940124	.0962567	.61317	684.5156	518.7000	569.0855	18.9411
56	1.53285	2.2031E-02	.379991	1.000000	1.21569E-01	.1831964	.0892974	.59241	661.3337	518.7000	566.2765	18.6342
57	1.59521	2.3421E-02	.365991	1.000000	1.20213E-01	.1721040	.0823237	.57058	636.9683	518.7000	563.3958	18.3266
58	1.66128	2.4896E-02	.351267	1.000000	1.18626E-01	.1607493	.0753559	.54763	611.3431	518.7000	560.4470	18.0194
59	1.73151	2.6461E-02	.335771	1.000000	1.16782E-01	.1491501	.0684162	.52347	584.3727	518.7000	557.4346	17.7133
60	1.80642	2.8120E-02	.319445	1.000000	1.14647E-01	.1373284	.0615292	.49801	555.9598	518.7000	554.3645	17.4096
61	1.88666	2.9880E-02	.302226	1.000000	1.12185E-01	.1253113	.0547220	.47117	525.9921	518.7000	551.2436	17.1094
62	1.97302	3.1746E-02	.284038	1.000000	1.09349E-01	.1131313	.0480249	.44281	494.3374	518.7000	548.0805	16.8140
63	2.06653	3.3726E-02	.264789	1.000000	1.06083E-01	.1008279	.0414717	.41281	460.8367	518.7000	544.8852	16.5250
64	2.16855	3.5826E-02	.244366	1.000000	1.02315E-01	.0884479	.0351004	.38097	425.2931	518.7000	541.6701	16.2440
65	2.28091	3.8053E-02	.222624	1.000000	9.79503E-02	.0760469	.0289543	.34707	387.4530	518.7000	538.4495	15.9729
66	2.40620	4.0415E-02	.199365	1.000000	9.28577E-02	.0636901	.0230829	.31081	346.9735	518.7000	535.2405	15.7140
67	2.54839	4.2921E-02	.174303	1.000000	8.68415E-02	.0514517	.0175446	.27174	303.3564	518.7000	532.0621	15.4698
68	2.71399	4.5578E-02	.146976	1.000000	7.95803E-02	.0394105	.0124084	.22914	255.7961	518.7000	528.9350	15.2432
69	2.91546	4.8397E-02	.116486	1.000000	7.04500E-02	.0276242	.0077564	.18160	202.7322	518.7000	525.8741	15.0381
70	3.18511	5.1387E-02	.080262	1.000000	5.76217E-02	.0159218	.0036665	.12513	139.6871	518.7000	522.8349	14.8577
71	3.79092	5.4558E-02	.025966	1.000000	2.64482E-02	.0026914	.0003824	.04048	45.1909	518.7000	519.3990	14.7129
72	13.89743	5.7921E-02	.000501	1.000000	3.50558E-03	.0000360	.0000001	.00078	.8727	518.7000	518.7094	14.6960
73	19.56393	6.1488E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (56) X= 13.00000 PRESSURE= 14.6960

N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
		*		** DIMENSIONLESS		**		**		** DIMENSIONAL	**	*
1	.00000	.0	.597894	1.000000	1.07715E-01	.3807826	.2505926	.93212	1040.5712	518.7000	617.5901	25.7477
2	.06908	5.4558E-05	.597894	1.000000	1.07715E-01	.3807826	.2505926	.93212	1040.5712	518.7000	617.5901	25.7477
3	.09917	1.1242E-04	.597365	1.000000	1.07840E-01	.3802470	.2500575	.93129	1039.6501	518.7000	617.4510	25.7241
4	.12334	1.7380E-04	.596697	1.000000	1.07996E-01	.3795709	.2493832	.93025	1038.4875	518.7000	617.2754	25.6943
5	.14464	2.3830E-04	.595942	1.000000	1.08171E-01	.3788066	.2486225	.92907	1037.1732	518.7000	617.0769	25.6608
6	.16427	3.0734E-04	.595115	1.000000	1.08361E-01	.3779698	.2477913	.92778	1035.7337	518.7000	616.8596	25.6241
7	.18282	3.8118E-04	.594221	1.000000	1.08563E-01	.3770658	.2468954	.92639	1034.1783	518.7000	616.6248	25.5846
8	.20066	4.5885E-04	.593262	1.000000	1.08777E-01	.3760964	.2459369	.92490	1032.5097	518.7000	616.3731	25.5423
9	.21802	5.4123E-04	.592238	1.000000	1.09003E-01	.3750612	.2449160	.92330	1030.7272	518.7000	616.1042	25.4973
10	.23507	6.2861E-04	.591147	1.000000	1.09241E-01	.3739588	.2438317	.92160	1028.8284	518.7000	615.8179	25.4495
11	.25192	7.2122E-04	.589987	1.000000	1.09490E-01	.3727874	.2426827	.91979	1026.8094	518.7000	615.5137	25.3988
12	.26867	8.1959E-04	.588755	1.000000	1.09750E-01	.3715443	.2414669	.91787	1024.6659	518.7000	615.1909	25.3452
13	.28541	9.2386E-04	.587449	1.000000	1.10021E-01	.3702267	.2401824	.91583	1022.3925	518.7000	614.8487	25.2885
14	.30218	1.0344E-03	.586065	1.000000	1.10304E-01	.3688315	.2388265	.91368	1019.9835	518.7000	614.4864	25.2288
15	.31905	1.1517E-03	.584592	1.000000	1.10598E-01	.3673552	.2373969	.91139	1017.4328	518.7000	614.1030	25.1657
16	.33606	1.2761E-03	.583049	1.000000	1.10903E-01	.3657942	.2358906	.90897	1014.7336	518.7000	613.6976	25.0993
17	.35325	1.4081E-03	.581408	1.000000	1.11220E-01	.3641447	.2343051	.90642	1011.8788	518.7000	613.2692	25.0293
18	.37067	1.5480E-03	.579674	1.000000	1.11547E-01	.3624025	.2326372	.90371	1008.8610	518.7000	612.8167	24.9558
19	.38834	1.6965E-03	.577842	1.000000	1.11884E-01	.3605635	.2308840	.90086	1005.6722	518.7000	612.3392	24.8785
20	.40630	1.8539E-03	.575907	1.000000	1.12232E-01	.3586233	.2290425	.89784	1002.3041	518.7000	611.8353	24.7973
21	.42458	2.0209E-03	.573863	1.000000	1.12590E-01	.3565771	.2271095	.89465	998.7479	518.7000	611.3039	24.7120
22	.44322	2.1980E-03	.571707	1.000000	1.12957E-01	.3544203	.2250819	.89129	994.9945	518.7000	610.7438	24.6226
23	.46223	2.3859E-03	.569431	1.000000	1.13334E-01	.3521478	.2229564	.88774	991.0342	518.7000	610.1536	24.5288
24	.48166	2.5851E-03	.567031	1.000000	1.13719E-01	.3497546	.2207300	.88400	986.8571	518.7000	609.5320	24.4307
25	.50153	2.7964E-03	.564500	1.000000	1.14111E-01	.3472352	.2183994	.88006	982.4526	518.7000	608.8778	24.3279
26	.52187	3.0206E-03	.561833	1.000000	1.14510E-01	.3445842	.2159615	.87590	977.8096	518.7000	608.1893	24.2204
27	.54271	3.2583E-03	.559021	1.000000	1.14915E-01	.3417959	.2134132	.87151	972.9168	518.7000	607.4652	24.1080
28	.56408	3.5105E-03	.556060	1.000000	1.15324E-01	.3388646	.2107513	.86690	967.7621	518.7000	606.7039	23.9906
29	.58601	3.7779E-03	.552940	1.000000	1.15737E-01	.3357843	.2079730	.86203	962.3329	518.7000	605.9039	23.8680
30	.60854	4.0616E-03	.549655	1.000000	1.16152E-01	.3325488	.2050753	.85691	956.6161	518.7000	605.0637	23.7403
31	.63169	4.3625E-03	.546197	1.000000	1.16567E-01	.3291519	.2020554	.85152	950.5981	518.7000	604.1815	23.6071
32	.65551	4.6816E-03	.542558	1.000000	1.16980E-01	.3255872	.1989107	.84585	944.2645	518.7000	603.2557	23.4684
33	.68002	5.0201E-03	.538729	1.000000	1.17391E-01	.3218482	.1956386	.83988	937.6003	518.7000	602.2847	23.3241
34	.70527	5.3791E-03	.534701	1.000000	1.17795E-01	.3179284	.1922370	.83360	930.5900	518.7000	601.2667	23.1741
35	.73130	5.7599E-03	.530465	1.000000	1.18192E-01	.3138209	.1887037	.82699	923.2170	518.7000	600.2000	23.0182
36	.75814	6.1637E-03	.526010	1.000000	1.18578E-01	.3095191	.1850369	.82005	915.4645	518.7000	599.0828	22.8565
37	.78585	6.5921E-03	.521327	1.000000	1.18951E-01	.3050161	.1812350	.81275	907.3143	518.7000	597.9134	22.6888
38	.81447	7.0464E-03	.516405	1.000000	1.19307E-01	.3003051	.1772967	.80508	898.7478	518.7000	596.6899	22.5152
39	.84404	7.5283E-03	.511232	1.000000	1.19643E-01	.2953792	.1732211	.79701	889.7452	518.7000	595.4106	22.3354
40	.87462	8.0394E-03	.505797	1.000000	1.19956E-01	.2902316	.1690077	.78854	880.2860	518.7000	594.0738	22.1496
41	.90628	8.5815E-03	.500087	1.000000	1.20240E-01	.2848556	.1646564	.77964	870.3484	518.7000	592.6776	21.9577
42	.93906	9.1565E-03	.494089	1.000000	1.20493E-01	.2792445	.1601674	.77029	859.9098	518.7000	591.2204	21.7597
43	.97303	9.7663E-03	.487790	1.000000	1.20708E-01	.2733919	.1555416	.76046	848.9463	518.7000	589.7005	21.5557
44	1.00827	1.0413E-02	.481174	1.000000	1.20882E-01	.2672915	.1507804	.75015	837.4326	518.7000	588.1162	21.3457
45	1.04486	1.1099E-02	.474227	1.000000	1.21007E-01	.2609373	.1458857	.73932	825.3421	518.7000	586.4660	21.1299
46	1.08287	1.1827E-02	.466933	1.000000	1.21078E-01	.2543237	.1408600	.72795	812.6470	518.7000	584.7484	20.9082
47	1.12239	1.2599E-02	.459274	1.000000	1.21089E-01	.2474456	.1357068	.71601	799.3176	518.7000	582.9622	20.6810
48	1.16353	1.3417E-02	.451233	1.000000	1.21032E-01	.2402982	.1304300	.70347	785.3225	518.7000	581.1060	20.4482
49	1.20639	1.4286E-02	.442790	1.000000	1.20899E-01	.2328775	.1250346	.69031	770.6285	518.7000	579.1788	20.2103
50	1.25110	1.5206E-02	.433925	1.000000	1.20681E-01	.2251802	.1195262	.67649	755.2001	518.7000	577.1798	19.9674

PROFILES-- STA (56) X= 13.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TID	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
51	1.29779	1.6183E-02	.424617	1.000000	1.20369E-01	.2172038	.1139115	.66198	738.9997	518.7000	575.1083	19.7197
52	1.34661	1.7219E-02	.414841	1.000000	1.19952E-01	.2089470	.1081983	.64674	721.9868	518.7000	572.9640	19.4678
53	1.39773	1.8318E-02	.404574	1.000000	1.19420E-01	.2004096	.1023953	.63073	704.1183	518.7000	570.7468	19.2118
54	1.45133	1.9483E-02	.393789	1.000000	1.18759E-01	.1915928	.0965125	.61392	685.3475	518.7000	568.4571	18.9524
55	1.50763	2.0720E-02	.382456	1.000000	1.17954E-01	.1824994	.0905612	.59625	665.6240	518.7000	566.0955	18.6899
56	1.56687	2.2031E-02	.370544	1.000000	1.16992E-01	.1731343	.0845541	.57768	644.8930	518.7000	563.6634	18.4250
57	1.62935	2.3421E-02	.358019	1.000000	1.15853E-01	.1635042	.0785053	.55815	623.0944	518.7000	561.1624	18.1582
58	1.69539	2.4896E-02	.344843	1.000000	1.14517E-01	.1536187	.0724306	.53761	600.1621	518.7000	558.5951	17.8903
59	1.76538	2.6961E-02	.330973	1.000000	1.12963E-01	.1434901	.0663477	.51599	576.0226	518.7000	555.9647	17.6221
60	1.83278	2.8120E-02	.316361	1.000000	1.11163E-01	.1331342	.0602761	.49321	550.5931	518.7000	553.2752	17.3543
61	1.91915	2.9880E-02	.300955	1.000000	1.09086E-01	.1225706	.0542376	.46919	523.7797	518.7000	550.5319	17.0880
62	2.00419	3.1746E-02	.284691	1.000000	1.06697E-01	.1118234	.0482567	.44383	495.4735	518.7000	547.7408	16.8242
63	2.09574	3.3726E-02	.267425	1.000000	1.03951E-01	.1009222	.0423605	.41703	465.5467	518.7000	544.9097	16.5642
64	2.19492	3.5826E-02	.249280	1.000000	1.00793E-01	.0899024	.0365797	.38863	433.8449	518.7000	542.0479	16.3092
65	2.30316	3.8053E-02	.229935	1.000000	9.71546E-02	.0788064	.0309489	.35847	400.1768	518.7000	539.1662	16.0609
66	2.42246	4.0415E-02	.209318	1.000000	9.29435E-02	.0676849	.0255079	.32633	364.2958	518.7000	536.2779	15.6210
67	2.55562	4.2921E-02	.187238	1.000000	8.80315E-02	.0565970	.0203025	.29190	325.8679	518.7000	533.3984	15.5914
68	2.70694	4.5578E-02	.163416	1.000000	8.22261E-02	.0456103	.0153970	.25477	284.4076	518.7000	530.5451	15.3746
69	2.88357	4.8397E-02	.137397	1.000000	7.52057E-02	.0347946	.0108258	.21420	239.1249	518.7000	527.7362	15.1734
70	3.09932	5.1387E-02	.108284	1.000000	6.63268E-02	.0241923	.0066950	.16881	188.4561	518.7000	524.9828	14.9913
71	3.39143	5.4558E-02	.073354	1.000000	5.35493E-02	.0135733	.0030605	.11436	127.6641	518.7000	522.2250	14.8310
72	4.11604	5.7921E-02	.020735	1.000000	2.28342E-02	.0019357	.0002438	.03233	36.0874	518.7000	519.2027	14.7068
73	18.38961	6.1488E-02	.000294	1.000000	2.72296E-03	.0000217	.0000000	.00046	.5125	518.7000	518.7056	14.6960
74	26.05561	6.5271E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (58) X= 15.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT*
1	.00000	.0	.522317	1.000000	1.00194E-01	.2940491	.1820341	.81429	909.0370	518.7000	595.0652	22.7241
2	.07391	5.4558E-05	.522317	1.000000	1.00194E-01	.2940491	.1820341	.81429	909.0370	518.7000	595.0652	22.7241
3	.10611	1.1242E-04	.521936	1.000000	1.00267E-01	.2937048	.1817259	.81370	908.3732	518.7000	594.9758	22.7105
4	.13195	1.7380E-04	.521454	1.000000	1.00358E-01	.2932700	.1813371	.81295	907.5348	518.7000	594.8629	22.6933
5	.15473	2.3990E-04	.520907	1.000000	1.00460E-01	.2927780	.1808979	.81210	906.5861	518.7000	594.7351	22.6740
6	.17572	3.0794E-04	.520311	1.000000	1.00570E-01	.2922388	.1804172	.81117	905.5460	518.7000	594.5951	22.6528
7	.19556	3.8118E-04	.519665	1.000000	1.00689E-01	.2916559	.1798983	.81016	904.4211	518.7000	594.4437	22.6299
8	.21463	4.5845E-04	.518971	1.000000	1.00815E-01	.2910300	.1793422	.80908	903.2131	518.7000	594.2811	22.6054
9	.23318	5.4123E-04	.518228	1.000000	1.00948E-01	.2903610	.1787487	.80792	901.9211	518.7000	594.1074	22.5792
10	.25139	6.2861E-04	.517437	1.000000	1.01089E-01	.2896477	.1781172	.80668	900.5431	518.7000	593.9222	22.5513
11	.26939	7.2120E-04	.516594	1.000000	1.01237E-01	.2888888	.1774466	.80537	899.0761	518.7000	593.7251	22.5218
12	.28723	8.1959E-04	.515698	1.000000	1.01392E-01	.2880825	.1767355	.80397	897.5165	518.7000	593.5157	22.4904
13	.30515	9.2386E-04	.514746	1.000000	1.01555E-01	.2872267	.1759824	.80249	895.8602	518.7000	593.2934	22.4572
14	.32305	1.0344E-03	.513736	1.000000	1.01725E-01	.2863192	.1751857	.80091	894.1026	518.7000	593.0577	22.4221
15	.34105	1.1517E-03	.512665	1.000000	1.01902E-01	.2853575	.1743436	.79925	892.2388	518.7000	592.8080	22.3849
16	.35917	1.2761E-03	.511530	1.000000	1.02087E-01	.2843392	.1734541	.79748	890.2636	518.7000	592.5435	22.3457
17	.37752	1.4081E-03	.510328	1.000000	1.02280E-01	.2832613	.1725151	.79560	888.1711	518.7000	592.2636	22.3043
18	.39608	1.5480E-03	.509055	1.000000	1.02480E-01	.2821211	.1715247	.79362	885.9556	518.7000	591.9675	22.2606
19	.41491	1.6965E-03	.507708	1.000000	1.02688E-01	.2809155	.1704806	.79152	883.6106	518.7000	591.6544	22.2146
20	.43404	1.8539E-03	.506282	1.000000	1.02904E-01	.2796413	.1693806	.78929	881.1295	518.7000	591.3235	22.1660
21	.45350	2.0209E-03	.504774	1.000000	1.03126E-01	.2782951	.1682224	.78694	878.5051	518.7000	590.9739	22.1150
22	.47333	2.1980E-03	.503180	1.000000	1.03356E-01	.2768734	.1670035	.78446	875.7303	518.7000	590.6046	22.0612
23	.49356	2.3859E-03	.501494	1.000000	1.03593E-01	.2753726	.1657215	.78183	872.7970	518.7000	590.2149	22.0047
24	.51421	2.5851E-03	.499713	1.000000	1.03837E-01	.2737889	.1643740	.77905	869.6973	518.7000	589.8036	21.9452
25	.53533	2.7964E-03	.497832	1.000000	1.04087E-01	.2721184	.1629583	.77612	866.4225	518.7000	589.3698	21.8828
26	.55693	3.0206E-03	.495844	1.000000	1.04343E-01	.2703569	.1614721	.77302	862.9637	518.7000	588.9123	21.8173
27	.57905	3.2583E-03	.493746	1.000000	1.04605E-01	.2685003	.1599126	.76975	859.3114	518.7000	588.4301	21.7485
28	.60172	3.5105E-03	.491530	1.000000	1.04871E-01	.2665442	.1582773	.76630	855.4558	518.7000	587.9221	21.6764
29	.62497	3.7779E-03	.489192	1.000000	1.05142E-01	.2644839	.1565635	.76265	851.3867	518.7000	587.3871	21.6008
30	.64884	4.0616E-03	.486725	1.000000	1.05416E-01	.2623150	.1547687	.75880	847.0932	518.7000	586.8238	21.5216
31	.67335	4.3625E-03	.484123	1.000000	1.05693E-01	.2600325	.1528902	.75475	842.5640	518.7000	586.2310	21.4388
32	.69855	4.6816E-03	.481378	1.000000	1.05970E-01	.2576315	.1509256	.75047	837.7872	518.7000	585.6075	21.3521
33	.72447	5.0201E-03	.478484	1.000000	1.06249E-01	.2551070	.1488723	.74596	832.7506	518.7000	584.9519	21.2616
34	.75114	5.3791E-03	.475434	1.000000	1.06525E-01	.2524537	.1467278	.74120	827.4411	518.7000	584.2628	21.1670
35	.77862	5.7599E-03	.472218	1.000000	1.06800E-01	.2496664	.1444898	.73619	821.8452	518.7000	583.5380	21.0683
36	.80693	6.1637E-03	.468830	1.000000	1.07069E-01	.2467397	.1421560	.73091	815.9488	518.7000	582.7788	20.9654
37	.83612	6.5921E-03	.465261	1.000000	1.07333E-01	.2436680	.1397242	.72534	809.7368	518.7000	581.9811	20.8581
38	.86624	7.0464E-03	.461501	1.000000	1.07588E-01	.2404457	.1371925	.71948	803.1938	518.7000	581.1443	20.7465
39	.89734	7.5283E-03	.457512	1.000000	1.07833E-01	.2370672	.1345589	.71331	796.3035	518.7000	580.2669	20.6303
40	.92946	8.0394E-03	.453374	1.000000	1.08064E-01	.2335268	.1318217	.70681	789.0487	518.7000	579.3474	20.5096
41	.96267	8.5815E-03	.448986	1.000000	1.08279E-01	.2298187	.1289796	.69997	781.4116	518.7000	578.3844	20.3843
42	.99702	9.1565E-03	.444367	1.000000	1.08475E-01	.2259373	.1260313	.69277	773.3732	518.7000	577.3764	20.2542
43	1.03258	9.7663E-03	.439505	1.000000	1.08648E-01	.2218768	.1229757	.68519	764.9139	518.7000	576.3219	20.1195
44	1.06941	1.0413E-02	.434392	1.000000	1.08796E-01	.2176316	.1198124	.67722	756.0128	518.7000	575.2194	19.9800
45	1.10759	1.1099E-02	.429011	1.000000	1.08912E-01	.2131960	.1165409	.66883	746.6482	518.7000	574.0675	19.8357
46	1.14719	1.1827E-02	.423351	1.000000	1.08994E-01	.2085648	.1131613	.66000	736.7969	518.7000	572.8648	19.6867
47	1.18830	1.2599E-02	.417397	1.000000	1.09037E-01	.2037327	.1096741	.65072	726.4348	518.7000	571.6098	19.5329
48	1.23102	1.3417E-02	.411135	1.000000	1.09034E-01	.1986946	.1060802	.64096	715.5361	518.7000	570.3014	19.3744
49	1.27544	1.4286E-02	.404549	1.000000	1.08980E-01	.1934460	.1023811	.63069	704.0739	518.7000	568.9384	19.2112
50	1.32168	1.5206E-02	.397623	1.000000	1.08869E-01	.1879824	.0985787	.61989	692.0194	518.7000	567.5195	19.0435

PROFILES-- STA (58) X= 15.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
51	1.36985	1.6183E-02	.390338	1.000000	1.08694E-01	.1823001	.0946758	.60854	679.3422	518.7000	566.0437	18.8714
52	1.42010	1.7219E-02	.382678	1.000000	1.08447E-01	.1763958	.0906754	.59659	666.0099	518.7000	564.5104	18.6950
53	1.47257	1.8318E-02	.374621	1.000000	1.08119E-01	.1702668	.0865817	.58403	651.9880	518.7000	562.9187	18.5144
54	1.52743	1.9483E-02	.366147	1.000000	1.07702E-01	.1639112	.0823995	.57082	637.2396	518.7000	561.2681	18.3300
55	1.58486	2.0720E-02	.357233	1.000000	1.07185E-01	.1573282	.0781343	.55693	621.7250	518.7000	559.5585	18.1419
56	1.64509	2.2031E-02	.347853	1.000000	1.06556E-01	.1505179	.0737929	.54230	605.4017	518.7000	557.7898	17.9504
57	1.70834	2.3421E-02	.337983	1.000000	1.05804E-01	.1434818	.0693828	.52692	588.2235	518.7000	555.9625	17.7559
58	1.77490	2.4896E-02	.327593	1.000000	1.04914E-01	.1362226	.0649129	.51072	570.1403	518.7000	554.0773	17.5588
59	1.84507	2.6461E-02	.316651	1.000000	1.03869E-01	.1287451	.0603931	.49366	551.0971	518.7000	552.1354	17.3595
60	1.91925	2.8120E-02	.305123	1.000000	1.02653E-01	.1210557	.0558350	.47569	531.0336	518.7000	550.1384	17.1584
61	1.99785	2.9880E-02	.292970	1.000000	1.01243E-01	.1131634	.0512514	.45674	509.8824	518.7000	548.0888	16.9563
62	2.08140	3.1746E-02	.280148	1.000000	9.96175E-02	.1050797	.0466570	.43675	487.5681	518.7000	545.9894	16.7537
63	2.17052	3.3726E-02	.266609	1.000000	9.77472E-02	.0968193	.0420684	.41564	464.0049	518.7000	543.8442	16.5513
64	2.26600	3.5826E-02	.252296	1.000000	9.55996E-02	.0884005	.0375043	.39333	439.0935	518.7000	541.6578	16.3500
65	2.36879	3.8053E-02	.237140	1.000000	9.31346E-02	.0798457	.0329960	.36970	412.7174	518.7000	539.4361	16.1508
66	2.48013	4.0415E-02	.221063	1.000000	9.03028E-02	.0711822	.0285377	.34464	384.7361	518.7000	537.1862	15.9546
67	2.60166	4.2921E-02	.203963	1.000000	8.70412E-02	.0624431	.0241870	.31798	354.9756	518.7000	534.9166	15.7627
68	2.73560	4.5578E-02	.185712	1.000000	8.32661E-02	.0536675	.0199661	.28953	323.2122	518.7000	532.6376	15.5765
69	2.88513	4.8397E-02	.166137	1.000000	7.88606E-02	.0449020	.0159123	.25901	289.1432	518.7000	530.3611	15.3978
70	3.05510	5.1387E-02	.144985	1.000000	7.36480E-02	.0361991	.0120702	.22603	252.3302	518.7000	528.1010	15.2283
71	3.25361	5.4558E-02	.121849	1.000000	6.73319E-02	.0276137	.0084935	.18996	212.0648	518.7000	525.8713	15.0706
72	3.49634	5.7921E-02	.095932	1.000000	5.93135E-02	.0191778	.0052467	.14956	166.9590	518.7000	523.6805	14.9274
73	3.82618	6.1488E-02	.064642	1.000000	4.75995E-02	.0106539	.0023750	.10078	112.5028	518.7000	521.4668	14.8007
74	4.67710	6.5271E-02	.017340	1.000000	1.99497E-02	.0014508	.0001705	.02703	30.1789	518.7000	519.0768	14.7035
75	22.75593	6.9284E-02	.000214	1.000000	2.29119E-03	.0000153	.0000000	.00033	.3728	518.7000	518.7040	14.6960
76	32.30893	7.3541E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (63) X= 20.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT*
1	.00000	.0	.397688	1.000000	8.04161E-02	.1723498	.0986144	.62000	692.1340	518.7000	563.4596	19.0451
2	.08470	5.4558E-05	.397688	1.000000	8.04161E-02	.1723498	.0986144	.62000	692.1340	518.7000	563.4596	19.0451
3	.12160	1.1242E-04	.397477	1.000000	8.04475E-02	.1722017	.0985000	.61967	691.7668	518.7000	563.4212	19.0401
4	.15121	1.7380E-04	.397211	1.000000	8.04870E-02	.1720146	.0983555	.61925	691.3029	518.7000	563.3726	19.0337
5	.17731	2.3820E-04	.396909	1.000000	8.05314E-02	.1718027	.0981921	.61878	690.7775	518.7000	563.3176	19.0265
6	.20134	3.0794E-04	.396578	1.000000	8.05798E-02	.1715703	.0980129	.61826	690.2012	518.7000	563.2572	19.0186
7	.22405	3.8118E-04	.396219	1.000000	8.06318E-02	.1713189	.0978193	.61771	689.5773	518.7000	563.1919	19.0100
8	.24588	4.5855E-04	.395834	1.000000	8.06873E-02	.1710487	.0976114	.61711	688.9066	518.7000	563.1217	19.0009
9	.26711	5.4123E-04	.395421	1.000000	8.07462E-02	.1707596	.0973891	.61646	688.1887	518.7000	563.0466	18.9911
10	.28791	6.2861E-04	.394981	1.000000	8.08085E-02	.1704510	.0971521	.61578	687.4223	518.7000	562.9665	18.9806
11	.30853	7.2129E-04	.394512	1.000000	8.08744E-02	.1701224	.0969000	.61504	686.6055	518.7000	562.8812	18.9695
12	.32898	8.1959E-04	.394012	1.000000	8.09438E-02	.1697728	.0966321	.61427	685.7361	518.7000	562.7904	18.9577
13	.34939	9.2386E-04	.393481	1.000000	8.10169E-02	.1694013	.0963478	.61344	684.8118	518.7000	562.6939	18.9451
14	.36984	1.0344E-03	.392917	1.000000	8.10937E-02	.1690068	.0960462	.61256	683.8298	518.7000	562.5914	18.9318
15	.39039	1.1517E-03	.392318	1.000000	8.11743E-02	.1685882	.0957267	.61162	682.7870	518.7000	562.4827	18.9177
16	.41110	1.2761E-03	.391682	1.000000	8.12589E-02	.1681443	.0953883	.61063	681.6804	518.7000	562.3675	18.9028
17	.43201	1.4081E-03	.391007	1.000000	8.13474E-02	.1676738	.0950302	.60958	680.5066	518.7000	562.2453	18.8870
18	.45318	1.5480E-03	.390292	1.000000	8.14399E-02	.1671753	.0946513	.60847	679.2618	518.7000	562.1158	18.8703
19	.47463	1.6965E-03	.389534	1.000000	8.15366E-02	.1666473	.0942508	.60728	677.9424	518.7000	561.9787	18.8527
20	.49642	1.8539E-03	.388731	1.000000	8.16374E-02	.1660883	.0938274	.60603	676.5441	518.7000	561.8335	18.8340
21	.51858	2.0209E-03	.387880	1.000000	8.17425E-02	.1654966	.0933802	.60470	675.0628	518.7000	561.6798	18.8143
22	.54119	2.1980E-03	.386978	1.000000	8.18518E-02	.1648707	.0929079	.60330	673.4938	518.7000	561.5173	18.7934
23	.56414	2.3859E-03	.386023	1.000000	8.19654E-02	.1642086	.0924094	.60181	671.8324	518.7000	561.3453	18.7715
24	.58760	2.5851E-03	.385013	1.000000	8.20833E-02	.1635085	.0918835	.60023	670.0736	518.7000	561.1635	18.7483
25	.61158	2.7964E-03	.383943	1.000000	8.22053E-02	.1627685	.0913288	.59857	668.2119	518.7000	560.9713	18.7238
26	.63608	3.0206E-03	.382811	1.000000	8.23315E-02	.1619865	.0907441	.59680	666.2419	518.7000	560.7682	18.6980
27	.66116	3.2583E-03	.381614	1.000000	8.24617E-02	.1611603	.0901280	.59494	664.1577	518.7000	560.5537	18.6708
28	.68683	3.5105E-03	.380347	1.000000	8.25958E-02	.1602879	.0894792	.59296	661.9531	518.7000	560.3271	18.6422
29	.71315	3.7779E-03	.379007	1.000000	8.27336E-02	.1593668	.0887960	.59087	659.6215	518.7000	560.0879	18.6121
30	.74013	4.0616E-03	.377591	1.000000	8.28749E-02	.1583946	.0880772	.58866	657.1562	518.7000	559.8354	18.5804
31	.76782	4.3625E-03	.376093	1.000000	8.30194E-02	.1573689	.0873211	.58633	654.5501	518.7000	559.5691	18.5470
32	.79625	4.6816E-03	.374511	1.000000	8.31667E-02	.1562871	.0865263	.58386	651.7955	518.7000	559.2881	18.5120
33	.82546	5.0201E-03	.372838	1.000000	8.33165E-02	.1551464	.0856913	.58125	648.8846	518.7000	558.9919	18.4752
34	.85542	5.3791E-03	.371071	1.000000	8.34683E-02	.1539441	.0848143	.57850	645.8092	518.7000	558.6796	18.4365
35	.88637	5.7599E-03	.369204	1.000000	8.36215E-02	.1526773	.0838939	.57559	642.5605	518.7000	558.3506	18.3959
36	.91816	6.1637E-03	.367233	1.000000	8.37754E-02	.1513431	.0829284	.57252	639.1295	518.7000	558.0041	18.3533
37	.95082	6.5921E-03	.365151	1.000000	8.39294E-02	.1499384	.0819162	.56927	635.5065	518.7000	557.6393	18.3087
38	.98461	7.0464E-03	.362953	1.000000	8.40825E-02	.1484600	.0808558	.56584	631.6815	518.7000	557.2554	18.2619
39	1.01937	7.5283E-03	.360634	1.000000	8.42339E-02	.1469049	.0797455	.56223	627.6442	518.7000	556.8515	18.2129
40	1.05522	8.0394E-03	.358185	1.000000	8.43823E-02	.1452695	.0785837	.55841	623.3833	518.7000	556.4268	18.1617
41	1.09221	8.5815E-03	.355602	1.000000	8.45267E-02	.1435507	.0773689	.55438	618.8874	518.7000	555.9804	18.1081
42	1.13040	9.1565E-03	.352877	1.000000	8.46655E-02	.1417449	.0760997	.55014	614.1444	518.7000	555.5115	18.0522
43	1.16985	9.7663E-03	.350002	1.000000	8.47973E-02	.1398487	.0747744	.54565	609.1414	518.7000	555.0190	17.9937
44	1.21063	1.0413E-02	.346971	1.000000	8.49203E-02	.1378585	.0733918	.54093	603.8652	518.7000	554.5022	17.9327
45	1.25280	1.1099E-02	.343774	1.000000	8.50327E-02	.1357708	.0719506	.53594	598.3017	518.7000	553.9600	17.8692
46	1.29644	1.1827E-02	.340404	1.000000	8.51322E-02	.1335819	.0704494	.53069	592.4362	518.7000	553.3915	17.8030
47	1.34162	1.2599E-02	.336851	1.000000	8.52166E-02	.1312882	.0688872	.52515	586.2531	518.7000	552.7958	17.7341
48	1.38843	1.3417E-02	.333107	1.000000	8.52832E-02	.1288862	.0672630	.51931	579.7363	518.7000	552.1720	17.6624
49	1.43697	1.4286E-02	.329160	1.000000	8.53292E-02	.1263723	.0655760	.51316	572.8684	518.7000	551.5192	17.5880
50	1.48732	1.5206E-02	.325002	1.000000	8.53513E-02	.1237429	.0638255	.50668	565.6315	518.7000	550.8363	17.5108

PROFILES-- STA (63)   X= 20.00000   PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
51	1.53960	1.6183E-02	.320621	1.000000	8.53462E-02	.1209946	.0620110	.49985	558.0065	518.7000	550.1226	17.4308
52	1.59392	1.7219E-02	.316005	1.000000	8.53098E-02	.1181242	.0601323	.49265	549.9732	518.7000	549.3771	17.3480
53	1.65041	1.8318E-02	.311143	1.000000	8.52380E-02	.1151284	.0581893	.48507	541.5104	518.7000	548.5991	17.2623
54	1.70920	1.9483E-02	.306020	1.000000	8.51260E-02	.1120043	.0561824	.47709	532.5955	518.7000	547.7878	17.1738
55	1.77045	2.0720E-02	.300624	1.000000	8.49688E-02	.1087490	.0541121	.46867	523.2046	518.7000	546.9424	17.0825
56	1.83433	2.2031E-02	.294940	1.000000	8.47606E-02	.1053602	.0519794	.45981	513.3123	518.7000	546.0623	16.9884
57	1.90102	2.3421E-02	.288953	1.000000	8.44950E-02	.1018357	.0497856	.45048	502.8914	518.7000	545.1469	16.8916
58	1.97074	2.4896E-02	.282645	1.000000	8.41652E-02	.0981738	.0475324	.44064	491.9130	518.7000	544.1959	16.7923
59	2.04371	2.6461E-02	.275999	1.000000	8.37634E-02	.0943733	.0452222	.43028	480.3461	518.7000	543.2090	16.6904
60	2.12020	2.8120E-02	.268995	1.000000	8.32808E-02	.0904336	.0428577	.41936	468.1572	518.7000	542.1858	16.5861
61	2.20050	2.9880E-02	.261614	1.000000	8.27080E-02	.0863548	.0404423	.40786	455.3103	518.7000	541.1265	16.4796
62	2.28496	3.1746E-02	.253831	1.000000	8.20341E-02	.0821378	.0379800	.39572	441.7662	518.7000	540.0314	16.3710
63	2.37397	3.3726E-02	.245624	1.000000	8.12469E-02	.0777845	.0354758	.38293	427.4820	518.7000	538.9008	16.2606
64	2.46990	3.5826E-02	.236964	1.000000	8.03325E-02	.0732977	.0329353	.36943	412.4107	518.7000	537.7356	16.1485
65	2.56757	3.8053E-02	.227822	1.000000	7.92752E-02	.0686819	.0303651	.35517	396.5002	518.7000	536.5368	16.0352
66	2.67332	4.0415E-02	.218164	1.000000	7.80566E-02	.0639426	.0277729	.34012	379.6918	518.7000	535.3060	15.9208
67	2.78604	4.2921E-02	.207953	1.000000	7.66552E-02	.0590875	.0251675	.32420	361.9194	518.7000	534.0451	15.8059
68	2.90665	4.5578E-02	.197143	1.000000	7.50459E-02	.0541261	.0225593	.30735	343.1068	518.7000	532.7567	15.6909
69	3.03635	4.8397E-02	.185685	1.000000	7.31980E-02	.0490704	.0199601	.28948	323.1646	518.7000	531.4437	15.5763
70	3.17662	5.1387E-02	.173516	1.000000	7.10740E-02	.0439351	.0173836	.27051	301.9862	518.7000	530.1101	15.4627
71	3.32943	5.4558E-02	.160561	1.000000	6.86260E-02	.0387383	.0148458	.25032	279.4399	518.7000	528.7604	15.3507
72	3.49746	5.7921E-02	.146724	1.000000	6.57915E-02	.0335015	.0123654	.22874	255.3576	518.7000	527.4004	15.2413
73	3.68445	6.1488E-02	.131875	1.000000	6.24844E-02	.0282504	.0099641	.20559	229.5137	518.7000	526.0367	15.1354
74	3.89609	6.5271E-02	.115826	1.000000	5.85780E-02	.0230145	.0076679	.18057	201.5824	518.7000	524.6769	15.0342
75	4.14163	6.9284E-02	.098277	1.000000	5.38686E-02	.0178254	.0055079	.15321	171.0410	518.7000	523.3293	14.9389
76	4.43853	7.3541E-02	.078656	1.000000	4.79718E-02	.0127068	.0035207	.12262	136.8924	518.7000	522.0000	14.8513
77	4.83020	7.8055E-02	.055430	1.000000	3.98263E-02	.0076013	.0017452	.08642	96.4704	518.7000	520.6741	14.7730
78	5.61396	8.2843E-02	.021124	1.000000	2.04593E-02	.0016521	.0002530	.03293	36.7640	518.7000	519.1290	14.7072
79	16.11482	8.7922E-02	.000598	1.000000	3.30256E-03	.0000321	.0000002	.00093	1.0416	518.7000	518.7083	14.6960
80	22.39856	9.3308E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (64) X= 21.00000 PRESSURE= 14.6960

N	Y	PST*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
				** DIMENSIONLESS	**			**		** DIMENSIONAL	**	
1	.00000	.0	.379569	1.000000	7.7094BE-02	.1571558	.0890819	.59175	660.5986	518.7000	559.5137	18.6247
2	.08670	5.4558E-05	.379569	1.000000	7.7094BE-02	.1571558	.0890819	.59175	660.5986	518.7000	559.5137	18.6247
3	.12446	1.1242E-04	.379377	1.000000	7.71228E-02	.1570272	.0889843	.59145	660.2651	518.7000	559.4803	18.6204
4	.15477	1.7380E-04	.379135	1.000000	7.71580E-02	.1568646	.0888610	.59107	659.8436	518.7000	559.4381	18.6150
5	.18149	2.3890E-04	.378861	1.000000	7.71975E-02	.1566806	.0887215	.59064	659.3664	518.7000	559.3903	18.6088
6	.20609	3.0794E-04	.378560	1.000000	7.72406E-02	.1564788	.0885685	.59017	658.8427	518.7000	559.3379	18.6021
7	.22933	3.8118E-04	.378234	1.000000	7.72870E-02	.1562604	.0884032	.58967	658.2758	518.7000	559.2812	18.5948
8	.25167	4.5885E-04	.377884	1.000000	7.73364E-02	.1560257	.0882257	.58912	657.6664	518.7000	559.2202	18.5869
9	.27339	5.4123E-04	.377509	1.000000	7.73890E-02	.1557745	.0880358	.58854	657.0141	518.7000	559.1550	18.5786
10	.29471	6.2861E-04	.377109	1.000000	7.74446E-02	.1555064	.0878334	.58791	656.3175	518.7000	559.0854	18.5696
11	.31578	7.2129E-04	.376682	1.000000	7.75035E-02	.1552208	.0876180	.58725	655.5750	518.7000	559.0112	18.5601
12	.33671	8.1959E-04	.376228	1.000000	7.75655E-02	.1549170	.0873891	.58654	654.7848	518.7000	558.9323	18.5500
13	.35759	9.2386E-04	.375745	1.000000	7.76308E-02	.1545941	.0871460	.58579	653.9445	518.7000	558.8484	18.5393
14	.37852	1.0344E-03	.375232	1.000000	7.76995E-02	.1542512	.0868882	.58499	653.0516	518.7000	558.7594	18.5280
15	.39954	1.1517E-03	.374687	1.000000	7.77717E-02	.1538873	.0866150	.58414	652.1034	518.7000	558.6649	18.5159
16	.42072	1.2761E-03	.374109	1.000000	7.78474E-02	.1535013	.0863255	.58324	651.0970	518.7000	558.5646	18.5031
17	.44212	1.4081E-03	.373496	1.000000	7.79267E-02	.1530921	.0860191	.58228	650.0293	518.7000	558.4584	18.4896
18	.46377	1.5480E-03	.372845	1.000000	7.80098E-02	.1526585	.0856948	.58127	648.8970	518.7000	558.3457	18.4753
19	.48572	1.6965E-03	.372155	1.000000	7.80966E-02	.1521991	.0853518	.58019	647.6965	518.7000	558.2265	18.4602
20	.50800	1.8539E-03	.371424	1.000000	7.81873E-02	.1517127	.0849892	.57905	646.4242	518.7000	558.1001	18.4442
21	.53066	2.0209E-03	.370650	1.000000	7.82818E-02	.1511978	.0846061	.57784	645.0760	518.7000	557.9664	18.4273
22	.55373	2.1980E-03	.369829	1.000000	7.83803E-02	.1506529	.0842013	.57656	643.6479	518.7000	557.8249	18.4095
23	.57725	2.3859E-03	.368960	1.000000	7.84827E-02	.1500765	.0837739	.57521	642.1354	518.7000	557.6752	18.3906
24	.60124	2.5851E-03	.368040	1.000000	7.85890E-02	.1494668	.0833228	.57377	640.5339	518.7000	557.5169	18.3707
25	.62575	2.7964E-03	.367066	1.000000	7.86993E-02	.1488223	.0828468	.57226	638.8385	518.7000	557.3495	18.3497
26	.65080	3.0236E-03	.366035	1.000000	7.88135E-02	.1481409	.0823449	.57065	637.0441	518.7000	557.1725	18.3276
27	.67643	3.2583E-03	.364944	1.000000	7.89315E-02	.1474210	.0818157	.56895	635.1452	518.7000	556.9856	18.3042
28	.70267	3.5105E-03	.363789	1.000000	7.90533E-02	.1466605	.0812581	.56715	633.1363	518.7000	556.7881	18.2797
29	.72956	3.7779E-03	.362568	1.000000	7.91786E-02	.1458574	.0806708	.56524	631.0113	518.7000	556.5795	18.2538
30	.75713	4.0616E-03	.361277	1.000000	7.93073E-02	.1450095	.0800525	.56323	628.7639	518.7000	556.3593	18.2265
31	.78542	4.3625E-03	.359912	1.000000	7.94392E-02	.1441146	.0794018	.56110	626.3876	518.7000	556.1269	18.1978
32	.81446	4.6816E-03	.358468	1.000000	7.95740E-02	.1431705	.0787174	.55885	623.8754	518.7000	555.8917	18.1676
33	.84429	5.0201E-03	.356942	1.000000	7.97113E-02	.1421747	.0779978	.55647	621.2201	518.7000	555.6231	18.1359
34	.87496	5.3791E-03	.355330	1.000000	7.98508E-02	.1411247	.0772417	.55396	618.4140	518.7000	555.3504	18.1025
35	.90649	5.7599E-03	.353627	1.000000	7.99920E-02	.1400181	.0764476	.55130	615.4491	518.7000	555.0630	18.0675
36	.93894	6.1637E-03	.351827	1.000000	8.01344E-02	.1388522	.0756140	.54850	612.3170	518.7000	554.7602	18.0307
37	.97234	6.5921E-03	.349926	1.000000	8.02773E-02	.1376242	.0747395	.54553	609.0089	518.7000	554.4413	17.9922
38	1.00675	7.0464E-03	.347919	1.000000	8.04200E-02	.1363313	.0738227	.54241	605.5156	518.7000	554.1055	17.9517
39	1.04221	7.5283E-03	.345800	1.000000	8.05616E-02	.1349707	.0728619	.53910	601.8273	518.7000	553.7522	17.9094
40	1.07877	8.0394E-03	.343563	1.000000	8.07013E-02	.1335393	.0718559	.53561	597.9339	518.7000	553.3805	17.8650
41	1.11649	8.5815E-03	.341202	1.000000	8.08380E-02	.1320342	.0708031	.53193	593.8247	518.7000	552.9896	17.8186
42	1.15542	9.1565E-03	.338710	1.000000	8.09704E-02	.1304523	.0697021	.52805	589.4885	518.7000	552.5788	17.7700
43	1.19563	9.7663E-03	.336081	1.000000	8.10973E-02	.1287904	.0685515	.52395	584.9135	518.7000	552.1472	17.7193
44	1.23717	1.0413E-02	.333308	1.000000	8.12171E-02	.1270453	.0673500	.51963	580.0875	518.7000	551.6939	17.6663
45	1.28012	1.1099E-02	.330384	1.000000	8.13282E-02	.1252137	.0660963	.51507	574.9974	518.7000	551.2183	17.6110
46	1.32455	1.1827E-02	.327209	1.000000	8.14287E-02	.1232923	.0647892	.51026	569.6297	518.7000	550.7193	17.5533
47	1.37054	1.2599E-02	.324048	1.000000	8.15165E-02	.1212780	.0634275	.50519	563.9700	518.7000	550.1962	17.4933
48	1.41816	1.3417E-02	.320619	1.000000	8.15893E-02	.1191673	.0620103	.49985	558.0034	518.7000	549.6480	17.4308
49	1.46752	1.4286E-02	.317005	1.000000	8.16447E-02	.1169569	.0605365	.49421	551.7140	518.7000	549.0740	17.3658
50	1.51870	1.5206E-02	.313197	1.000000	8.16797E-02	.1146436	.0590055	.48827	545.0851	518.7000	548.4732	17.2983

PROFILES-- STA (64) X= 21.00000 PRESSURE= 14.6960

				** DIMENSIONLESS **			**		** DIMENSIONAL **		
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
51	1.57182	1.6183E-02	.309183	1.000000	8.16914E-02	.1122242	.0574166	.48202	538.0993	518.7000	547.8449	17.2282
52	1.62698	1.7219E-02	.304953	1.000000	8.16762E-02	.1096956	.0557693	.47542	530.7380	518.7000	547.1882	17.1555
53	1.68430	1.8318E-02	.300476	1.000000	8.16305E-02	.1070547	.0540635	.46847	522.9816	518.7000	546.5023	17.0803
54	1.74394	1.9483E-02	.295801	1.000000	8.15500E-02	.1042986	.0522990	.46115	514.8094	518.7000	545.7866	17.0025
55	1.80602	2.0720E-02	.290454	1.000000	8.14302E-02	.1014246	.0504762	.45344	506.1996	518.7000	545.0402	16.9221
56	1.87072	2.2031E-02	.285642	1.000000	8.12661E-02	.0984303	.0485955	.44532	497.1289	518.7000	544.2626	16.8392
57	1.93822	2.3421E-02	.280151	1.000000	8.10520E-02	.0953134	.0466578	.43676	487.5724	518.7000	543.4531	16.7537
58	2.00871	2.4896E-02	.274366	1.000000	8.07817E-02	.0920721	.0446644	.42774	477.5038	518.7000	542.6113	16.6658
59	2.08242	2.6461E-02	.268270	1.000000	8.04484E-02	.0887049	.0426168	.41823	466.8949	518.7000	541.7369	16.5755
60	2.15961	2.8120E-02	.261846	1.000000	8.00446E-02	.0852107	.0405172	.40822	455.7153	518.7000	540.8294	16.4829
61	2.24055	2.9880E-02	.255076	1.000000	7.95617E-02	.0815892	.0383681	.39766	443.9324	518.7000	539.8889	16.3881
62	2.32557	3.1746E-02	.247939	1.000000	7.89901E-02	.0778405	.0361726	.38654	431.5109	518.7000	538.9154	16.2913
63	2.41503	3.3726E-02	.240413	1.000000	7.83193E-02	.0739656	.0339346	.37480	418.4125	518.7000	537.9090	16.1926
64	2.50937	3.5826E-02	.232473	1.000000	7.75372E-02	.0699664	.0316585	.36243	404.5950	518.7000	536.8704	16.0922
65	2.60909	3.8053E-02	.224094	1.000000	7.66301E-02	.0658457	.0293497	.34936	390.0123	518.7000	535.8003	15.9904
66	2.71476	4.0415E-02	.215246	1.000000	7.55821E-02	.0616078	.0270142	.33557	374.6129	518.7000	534.6997	15.8874
67	2.82710	4.2921E-02	.205895	1.000000	7.43751E-02	.0572582	.0246593	.32099	358.3389	518.7000	533.5701	15.7835
68	2.94695	4.5578E-02	.196004	1.000000	7.29877E-02	.0528042	.0222934	.30557	341.1245	518.7000	532.4134	15.6792
69	3.07535	4.8397E-02	.185529	1.000000	7.13945E-02	.0482549	.0199259	.28924	322.8938	518.7000	531.2319	15.5748
70	3.21362	5.1387E-02	.174419	1.000000	6.95645E-02	.0436218	.0175683	.27192	303.5572	518.7000	530.0287	15.4708
71	3.36342	5.4558E-02	.162611	1.000000	6.74596E-02	.0389190	.0152334	.25351	283.0068	518.7000	528.8074	15.3678
72	3.52697	5.7921E-02	.150029	1.000000	6.50309E-02	.0341636	.0129363	.23389	261.1087	518.7000	527.5724	15.2665
73	3.70732	6.1488E-02	.136573	1.000000	6.22131E-02	.0293761	.0106948	.21292	237.6901	518.7000	526.3290	15.1677
74	3.90881	6.5271E-02	.122109	1.000000	5.89150E-02	.0245809	.0085301	.19037	212.5171	518.7000	525.0837	15.0722
75	4.13810	6.9284E-02	.106441	1.000000	5.49972E-02	.0198054	.0064675	.16594	185.2487	518.7000	523.8435	14.9812
76	4.40641	7.3541E-02	.089250	1.000000	5.02223E-02	.0150770	.0045378	.13914	155.3301	518.7000	522.6155	14.8961
77	4.73579	7.8055E-02	.069903	1.000000	4.40966E-02	.0104057	.0027785	.10898	121.6593	518.7000	521.4024	14.8185
78	5.18826	8.2843E-02	.046383	1.000000	3.49223E-02	.0056397	.0012213	.07231	80.7249	518.7000	520.1646	14.7499
79	6.45407	8.7922E-02	.011184	1.000000	1.39717E-02	.0006899	.0000709	.01744	19.4640	518.7000	518.8792	14.6991
80	56.11994	9.3308E-02	.000046	1.000000	7.53438E-04	.0000017	.0000000	.00007	.0792	518.7000	518.7004	14.6960
81	80.28519	9.9022E-02	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (72) X= 32.00000 PRESSURE= 14.6960

N	Y	PSI*	** DIMENSIONLESS ** UD	THD	TI	TTD	PTD	MACH **	** DIMENSIONAL ** U	T	TOT **	PTOT*
1	.00000	.0	.252915	1.000000	5.20483E-02	.0699791	.0376958	.39429	440.1715	518.7000	536.8737	16.3585
2	.19309	9.9022E-05	.252915	1.000000	5.20483E-02	.0699791	.0376958	.39429	440.1715	518.7000	536.8737	16.3585
3	.20542	2.0405E-04	.252761	1.000000	5.20690E-02	.0699096	.0376480	.39405	439.9027	518.7000	536.8557	16.3564
4	.25545	3.1544E-04	.252565	1.000000	5.20950E-02	.0698217	.0375876	.39375	439.5629	518.7000	536.8328	16.3537
5	.29255	4.3360E-04	.252344	1.000000	5.21242E-02	.0697222	.0375193	.39340	439.1781	518.7000	536.8070	16.3507
6	.34017	5.5891E-04	.252102	1.000000	5.21559E-02	.0696131	.0374445	.39303	438.7561	518.7000	536.7787	16.3474
7	.37855	6.9183E-04	.251839	1.000000	5.21900E-02	.0694950	.0373635	.39262	438.2992	518.7000	536.7480	16.3438
8	.41544	8.3281E-04	.251557	1.000000	5.22264E-02	.0693682	.0372767	.39218	437.8061	518.7000	536.7151	16.3400
9	.45133	9.8233E-04	.251255	1.000000	5.22649E-02	.0692325	.0371838	.39171	437.2824	518.7000	536.6798	16.3359
10	.48654	1.1409E-03	.250932	1.000000	5.23056E-02	.0690877	.0370848	.39120	436.7211	518.7000	536.6422	16.3315
11	.52135	1.3091E-03	.250589	1.000000	5.23485E-02	.0689335	.0369794	.39067	436.1230	518.7000	536.6022	16.3269
12	.55594	1.4876E-03	.250223	1.000000	5.23937E-02	.0687695	.0368675	.39010	435.4864	518.7000	536.5596	16.3219
13	.59046	1.6768E-03	.249834	1.000000	5.24412E-02	.0685952	.0367487	.38949	434.8096	518.7000	536.5143	16.3167
14	.62506	1.8775E-03	.249421	1.000000	5.24910E-02	.0684102	.0366227	.38885	434.0906	518.7000	536.4663	16.3111
15	.65983	2.0904E-03	.248982	1.000000	5.25431E-02	.0682139	.0364892	.38816	433.3271	518.7000	536.4153	16.3052
16	.69487	2.3162E-03	.248517	1.000000	5.25977E-02	.0680058	.0363478	.38744	432.5169	518.7000	536.3613	16.2990
17	.73026	2.5557E-03	.248023	1.000000	5.26547E-02	.0677853	.0361981	.38667	431.6576	518.7000	536.3040	16.2924
18	.76609	2.8097E-03	.247499	1.000000	5.27141E-02	.0675517	.0360398	.38585	430.7463	518.7000	536.2433	16.2854
19	.80243	3.0791E-03	.246944	1.000000	5.27761E-02	.0673043	.0358724	.38499	429.7804	518.7000	536.1791	16.2780
20	.83933	3.3648E-03	.246356	1.000000	5.28405E-02	.0670425	.0356955	.38407	428.7568	518.7000	536.1111	16.2702
21	.87687	3.6679E-03	.245733	1.000000	5.29073E-02	.0667655	.0355086	.38310	427.6725	518.7000	536.0392	16.2620
22	.91509	3.9894E-03	.245073	1.000000	5.29767E-02	.0664725	.0353113	.38207	426.5240	518.7000	535.9631	16.2533
23	.95407	4.3303E-03	.244375	1.000000	5.30484E-02	.0661627	.0351030	.38098	425.3080	518.7000	535.8826	16.2441
24	.99386	4.6920E-03	.243635	1.000000	5.31226E-02	.0658353	.0348832	.37983	424.0207	518.7000	535.7976	16.2344
25	1.03452	5.0755E-03	.242852	1.000000	5.31990E-02	.0654892	.0346514	.37861	422.6582	518.7000	535.7077	16.2242
26	1.07610	5.4824E-03	.242024	1.000000	5.32776E-02	.0651237	.0344071	.37732	421.2164	518.7000	535.6128	16.2134
27	1.11866	5.9139E-03	.241147	1.000000	5.33583E-02	.0647377	.0341496	.37595	419.6911	518.7000	535.5125	16.2021
28	1.16225	6.3715E-03	.240220	1.000000	5.34409E-02	.0643302	.0338784	.37450	418.0777	518.7000	535.4067	16.1901
29	1.20695	6.8569E-03	.239240	1.000000	5.35252E-02	.0639002	.0335929	.37298	416.3715	518.7000	535.2950	16.1775
30	1.25280	7.3718E-03	.238203	1.000000	5.36109E-02	.0634466	.0332925	.37136	414.5675	518.7000	535.1772	16.1643
31	1.29988	7.9179E-03	.237108	1.000000	5.36979E-02	.0629682	.0329766	.36965	412.6604	518.7000	535.0530	16.1503
32	1.34824	8.4971E-03	.235949	1.000000	5.37858E-02	.0624639	.0326444	.36785	410.6448	518.7000	534.9220	16.1357
33	1.39795	9.1114E-03	.234726	1.000000	5.38741E-02	.0619325	.0322954	.36594	408.5148	518.7000	534.7840	16.1203
34	1.44908	9.7630E-03	.233433	1.000000	5.39626E-02	.0613727	.0319289	.36392	406.2644	518.7000	534.6386	16.1041
35	1.50170	1.0454E-02	.232067	1.000000	5.40506E-02	.0607832	.0315443	.36179	403.8872	518.7000	534.4855	16.0872
36	1.55587	1.1187E-02	.230624	1.000000	5.41376E-02	.0601627	.0311408	.35954	401.3766	518.7000	534.3244	16.0694
37	1.61173	1.1965E-02	.229101	1.000000	5.42230E-02	.0595099	.0307178	.35717	398.7255	518.7000	534.1549	16.0507
38	1.66931	1.2789E-02	.227493	1.000000	5.43060E-02	.0588234	.0302746	.35466	395.9266	518.7000	533.9766	16.0312
39	1.72870	1.3664E-02	.225795	1.000000	5.43858E-02	.0581017	.0298106	.35201	392.9720	518.7000	533.7891	16.0107
40	1.79000	1.4591E-02	.224003	1.000000	5.44615E-02	.0573434	.0293251	.34922	389.8538	518.7000	533.5922	15.9893
41	1.85332	1.5575E-02	.222113	1.000000	5.45321E-02	.0565471	.0288175	.34627	386.5633	518.7000	533.3854	15.9669
42	1.91875	1.6619E-02	.220118	1.000000	5.45963E-02	.0557112	.0282871	.34316	383.0917	518.7000	533.1683	15.9435
43	1.98642	1.7726E-02	.218014	1.000000	5.46530E-02	.0548343	.0277334	.33988	379.4294	518.7000	532.9406	15.9191
44	2.05643	1.8900E-02	.215794	1.000000	5.47006E-02	.0539149	.0271558	.33642	375.5667	518.7000	532.7018	15.8936
45	2.12893	2.0145E-02	.213454	1.000000	5.47377E-02	.0529514	.0265538	.33277	371.4930	518.7000	532.4516	15.8671
46	2.20404	2.1466E-02	.210985	1.000000	5.47623E-02	.0519424	.0259268	.32893	367.1974	518.7000	532.1896	15.8394
47	2.28192	2.2867E-02	.208383	1.000000	5.47726E-02	.0508864	.0252745	.32487	362.6683	518.7000	531.9153	15.8107
48	2.36274	2.4352E-02	.205640	1.000000	5.47665E-02	.0497819	.0245965	.32059	357.8936	518.7000	531.6285	15.7808
49	2.44666	2.5928E-02	.202748	1.000000	5.47415E-02	.0486275	.0238925	.31608	352.8604	518.7000	531.3287	15.7497
50	2.53388	2.7600E-02	.199699	1.000000	5.46950E-02	.0474218	.0231622	.31133	347.5550	518.7000	531.0156	15.7175

PROFILES-- STA (72) X= 32.00000 PRESSURE= 14.6960

N	Y	PST*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
51	2.62461	2.9372E-02	.196486	1.000000	5.46241E-02	.0461636	.0224056	.30632	341.9630	518.7000	530.6888	15.6841
52	2.71909	3.1251E-02	.193100	1.000000	5.45256E-02	.0448517	.0216227	.30104	336.0692	518.7000	530.3481	15.6496
53	2.81756	3.3247E-02	.189530	1.000000	5.43960E-02	.0434849	.0208135	.29548	329.8573	518.7000	529.9931	15.6139
54	2.92031	3.5362E-02	.185768	1.000000	5.42312E-02	.0420623	.0199784	.28961	323.3099	518.7000	529.6237	15.5771
55	3.02765	3.7606E-02	.181803	1.000000	5.40270E-02	.0405831	.0191177	.28343	316.4086	518.7000	529.2395	15.5391
56	3.13994	3.9985E-02	.177623	1.000000	5.37785E-02	.0390467	.0182321	.27691	309.1336	518.7000	528.8405	15.5001
57	3.25757	4.2509E-02	.173216	1.000000	5.34802E-02	.0374527	.0173224	.27004	301.4635	518.7000	528.4265	15.4600
58	3.38100	4.5186E-02	.168568	1.000000	5.31261E-02	.0358010	.0163896	.26280	293.3753	518.7000	527.9976	15.4188
59	3.51072	4.8026E-02	.163667	1.000000	5.27095E-02	.0340918	.0154350	.25516	284.8441	518.7000	527.5537	15.3767
60	3.64735	5.1037E-02	.158494	1.000000	5.22227E-02	.0323256	.0144603	.24709	275.8426	518.7000	527.0950	15.3337
61	3.79155	5.4231E-02	.153035	1.000000	5.16569E-02	.0305036	.0134674	.23858	266.3410	518.7000	526.6218	15.2899
62	3.94414	5.7619E-02	.147269	1.000000	5.10023E-02	.0286271	.0124586	.22959	256.3061	518.7000	526.1345	15.2455
63	4.10607	6.1213E-02	.141176	1.000000	5.02474E-02	.0266984	.0114367	.22009	245.7009	518.7000	525.6336	15.2004
64	4.27848	6.5024E-02	.134730	1.000000	4.93787E-02	.0247203	.0104051	.21004	234.4836	518.7000	525.1199	15.1549
65	4.46277	6.9066E-02	.127906	1.000000	4.83806E-02	.0226963	.0093675	.19940	222.6061	518.7000	524.5943	15.1091
66	4.66067	7.3350E-02	.120670	1.000000	4.72339E-02	.0206310	.0083285	.18812	210.0125	518.7000	524.0579	15.0633
67	4.87437	7.7901E-02	.112984	1.000000	4.59155E-02	.0185302	.0072933	.17614	196.6359	518.7000	523.5123	15.0177
68	5.10680	8.2725E-02	.104801	1.000000	4.43961E-02	.0164008	.0062684	.16338	182.3944	518.7000	522.9593	14.9724
69	5.36175	8.7840E-02	.096061	1.000000	4.26376E-02	.0142511	.0052609	.14976	167.1838	518.7000	522.4010	14.9280
70	5.64465	9.3266E-02	.086684	1.000000	4.05887E-02	.0120913	.0042795	.13514	150.8650	518.7000	521.8401	14.8847
71	5.96354	9.9022E-02	.076557	1.000000	3.81753E-02	.0099330	.0033346	.11935	133.2393	518.7000	521.2796	14.8431
72	6.33131	1.0513E-01	.065499	1.000000	3.52809E-02	.0077891	.0024386	.10211	113.9945	518.7000	520.7228	14.8035
73	6.77149	1.1160E-01	.053186	1.000000	3.16909E-02	.0056704	.0016064	.08292	92.5641	518.7000	520.1726	14.7668
74	7.33830	1.1847E-01	.038853	1.000000	2.68435E-02	.0035637	.0008566	.06057	67.6201	518.7000	519.6255	14.7338
75	8.29347	1.2575E-01	.018989	1.000000	1.64374E-02	.0011368	.0002045	.02960	33.0482	518.7000	518.9952	14.7050
76	16.66649	1.3348E-01	.001018	1.000000	3.45362E-03	.0000357	.0000006	.00159	1.7724	518.7000	518.7093	14.6960
77	22.34807	1.4167E-01	.000000	1.000000	.0	.0000000	.0000000	.00000	.0000	518.7000	518.7000	14.6960

* J E T   A N A L Y S I S   P R O G R A M *

FREE JET   MIXING

NAME= DAVE FERGUSON
IDENT= USER MANUAL TEST CASE

* SUMMARY - STATION DATA - JET PROPERTIES *

N	X	R	YJ	UC	TC	TIC	PTC	TTC	VSONIC	WJ
1	.00000	.06897	1.03448	1.0000000	1.0000000	1.000000E-01	1.000000	1.000000	.990246	1.000000
2	.00010	.14133	1.07236	1.0000000	1.0000000	9.997216E-02	1.000000	.999781	.990875	.999651
3	.00020	.14135	1.07239	1.0000000	1.0000000	9.995393E-02	1.000000	.999771	.990877	.999654
4	.00030	.14137	1.07241	1.0000000	1.0000000	9.993571E-02	1.000000	.999760	.990880	.999657
5	.00050	.14142	1.07245	1.0000000	1.0000000	9.989930E-02	1.000000	.999739	.990885	.999664
6	.00080	.14149	1.07253	1.0000000	1.0000000	9.984475E-02	1.000000	.999707	.990892	.999674
7	.00100	.14154	1.07258	1.0000000	1.0000000	9.980843E-02	1.000000	.999686	.990897	.999681
8	.00200	.14182	1.07285	1.0000000	1.0000000	9.962745E-02	1.000000	.999581	.990920	.999718
9	.00400	.17713	1.07368	1.0000000	1.0000000	9.930695E-02	1.000000	.999395	.990971	.999821
10	.00600	.17849	1.07504	1.0000000	1.0000000	9.902145E-02	1.000000	.999230	.991019	.999973
11	.00800	.16380	1.06035	1.0000000	1.0000000	9.873345E-02	1.000000	.999065	.991060	1.000174
12	.01000	.15428	1.05084	1.0000000	1.0000000	9.842253E-02	1.000000	.998886	.991092	1.000422
13	.01500	.14500	1.04156	1.0000000	1.0000000	9.760277E-02	1.000000	.998418	.991158	1.001315
14	.01700	.14464	1.04120	1.0000000	1.0000000	9.726489E-02	1.000000	.998226	.991176	1.001881
15	.02000	.15044	1.04699	1.0000000	1.0000000	9.676414E-02	1.000000	.997943	.991204	1.003014
16	.04000	.20818	1.07024	1.0000000	1.0000000	9.414408E-02	1.000000	.996487	.991494	1.007884
17	.06000	.20821	1.07028	1.0000000	1.0000000	9.207295E-02	1.000000	.995364	.991983	1.011417
18	.08000	.21508	1.07715	1.0000000	1.0000000	9.018423E-02	1.000000	.994361	.992596	1.014262
19	.10000	.24539	1.10746	1.0000000	1.0000000	8.837060E-02	1.000000	.993418	.993236	1.017495
20	.12000	.28114	1.10873	1.0000000	1.0000000	8.680606E-02	1.000000	.992620	.993917	1.021133
21	.20000	.28114	1.10872	1.0000000	1.0000000	8.165448E-02	1.000000	.990093	.996050	1.032373
22	.25000	.33879	1.13189	1.0000000	1.0000000	7.910423E-02	1.000000	.988899	.996807	1.039873
23	.30000	.36256	1.15567	1.0000000	1.0000000	7.684389E-02	1.000000	.987873	.997234	1.047734
24	.34000	.39809	1.15671	1.0000000	1.0000000	7.523185E-02	1.000000	.987159	.997472	1.053023
25	.40000	.41611	1.17473	1.0000000	1.0000000	7.314687E-02	1.000000	.986258	.997757	1.061664
26	.45000	.43515	1.19377	1.0000000	1.0000000	7.154610E-02	1.000000	.985583	.997965	1.069194
27	.50000	.47047	1.19460	1.0000000	1.0000000	7.013780E-02	1.000000	.985002	.998157	1.075372
28	.55000	.49306	1.21720	1.0000000	1.0000000	6.884651E-02	1.000000	.984480	.998331	1.082543
29	.60000	.49545	1.21959	1.0000000	1.0000000	6.763929E-02	1.000000	.984000	.998488	1.088736
30	.65000	.55083	1.20048	1.0000000	1.0000000	6.653083E-02	1.000000	.983567	.998631	1.095549
31	.70000	.55532	1.20497	1.0000000	1.0000000	6.551925E-02	1.000000	.983178	.998751	1.101609
32	.80000	.61867	1.27384	1.0000000	1.0000000	6.365847E-02	1.000000	.982478	.998929	1.114118
33	1.00000	.69163	1.31732	1.0000000	1.0000000	6.058028E-02	1.000000	.981364	.999074	1.139143
34	1.20000	.77239	1.35860	1.0000000	1.0000000	5.802645E-02	1.000000	.980506	.998969	1.163374
35	1.50000	.90890	1.42614	1.0000000	1.0000000	5.510732E-02	1.000000	.979520	.998312	1.199734
36	1.70000	1.05329	1.53605	1.0000000	1.0000000	5.354531E-02	1.000000	.979026	.997048	1.224931
37	2.00000	1.14330	1.59157	1.0000000	1.0000000	5.157051E-02	1.000000	.978422	.995368	1.260263
38	2.50000	1.33020	1.67503	1.0000000	1.0000000	4.892779E-02	1.000000	.977648	.991442	1.322978
39	3.00000	1.54153	1.78291	1.0000000	1.0000000	4.686700E-02	1.000000	.977074	.986311	1.384491
40	3.40000	1.70670	1.87912	1.0000000	1.0000000	4.549843E-02	1.000000	.976705	.981310	1.438049
41	4.00000	1.90510	1.97407	.9999997	1.0000000	4.378583E-02	.999999	.976260	.972325	1.513996
42	4.12865	4.02317	2.01159	.9999992	1.0000000	4.345839E-02	.999997	.976175	.970170	1.529996
43	5.00000	4.96573	2.48287	.9998053	1.0000000	4.173388E-02	.999406	.975371	.950281	1.665130
44	6.00000	4.91213	2.45607	.9968794	1.0000000	4.041047E-02	.990513	.969384	.920529	1.806156
45	6.20000	5.23022	2.61511	.9952527	1.0000000	4.037512E-02	.985598	.966230	.913949	1.850626
46	6.50000	5.40171	2.72086	.9910943	1.0000000	4.087591E-02	.973131	.958331	.902766	1.884747
47	6.80000	5.27988	2.63994	.9845508	1.0000000	4.234528E-02	.953787	.946138	.891109	1.935794
48	7.00000	5.76919	2.88460	.9783655	1.0000000	4.417960E-02	.935807	.934815	.882916	1.977983
49	7.50000	5.60010	2.80005	.9542228	1.0000000	5.309195E-02	.868378	.892050	.859658	2.050156
50	8.00000	6.02094	3.01047	.9194278	1.0000000	6.647573E-02	.778501	.833428	.832664	2.131578

* SUMMARY * STATION DATA - JET PROPERTIES *

N	X	R	YJ	UC	TC	TIC	PTC	TTC	YSONIC	WJ
51	9.00000	6.38621	3.19311	.8401270	1.0000000	9.049697E-02	.602419	.708966	.765039	2.319558
52	10.00000	7.36984	3.68492	.7658402	1.0000000	1.037803E-01	.468488	.600677	.667046	2.511986
53	11.00000	7.97406	3.98703	.6998530	1.0000000	1.094459E-01	.370443	.510314	.509616	2.686567
54	12.00000	8.19031	4.09516	.6447621	1.0000000	1.099009E-01	.301381	.438700	.157005	2.869335
55	12.12730	8.03703	4.01852	.6383918	1.0000000	1.097317E-01	.294070	.430658		2.892589
56	13.00000	8.59920	4.29960	.5978900	1.0000000	1.077153E-01	.250593	.380783		3.057451
57	14.00000	9.11523	4.55762	.5575177	1.0000000	1.042313E-01	.212059	.333348		3.248461
58	15.00000	9.73013	4.86506	.5223171	1.0000000	1.001944E-01	.182034	.294049		3.441243
59	16.00000	10.50666	5.25333	.4914351	1.0000000	9.596504E-02	.158207	.261245		3.636285
60	17.00000	11.49468	5.74734	.4642247	1.0000000	9.172936E-02	.139023	.233688		3.841685
61	18.00000	12.07534	6.03767	.4399436	1.0000000	8.765245E-02	.123249	.210248		4.054463
62	19.00000	12.06555	6.03277	.4179142	1.0000000	8.386414E-02	.109974	.190012		4.253745
63	20.00000	12.21501	6.10750	.3976884	1.0000000	8.041608E-02	.098614	.172350		4.427178
64	21.00000	13.29767	6.64883	.3795687	1.0000000	7.709483E-02	.089082	.157156		4.623682
65	22.00000	14.53181	7.26590	.3629617	1.0000000	7.391728E-02	.080860	.143789		4.849999
66	23.00000	13.97439	6.98719	.3477205	1.0000000	7.103815E-02	.073732	.132059		5.035535
67	24.00000	14.90475	7.45237	.3335941	1.0000000	6.840033E-02	.067473	.121646		5.217901
68	25.00000	16.35144	8.17572	.3210929	1.0000000	6.574686E-02	.062205	.112665		5.455097
69	26.00000	15.56128	7.78064	.3089760	1.0000000	6.346655E-02	.057335	.104397		5.615330
70	28.00000	16.77975	8.38987	.2877918	1.0000000	5.914099E-02	.049366	.090581		6.027032
71	30.00000	18.21895	9.10948	.2692740	1.0000000	5.536259E-02	.042950	.079308		6.439166
72	32.00000	19.45325	9.72663	.2529150	1.0000000	5.204828E-02	.037696	.069979		6.841319
73	34.00000	20.33457	10.16728	.2383479	1.0000000	4.912212E-02	.033334	.062171		7.230077
74	36.00000	21.21059	10.60530	.2253424	1.0000000	4.650477E-02	.029688	.055588		7.608959

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EXECUTING PROGM=SSFD
TAPIN= T      TAPOT= T
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X/R = .0000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
18	.9745	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
17	.9485	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
16	.9219	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
15	.8943	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
14	.8658	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
13	.8365	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
12	.8061	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
11	.7745	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
10	.7415	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
9	.7069	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
4	.2058	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
3	.1678	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
2	.1174	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		1.0000

X/R = .0002

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0000	1.5585	.2426	.9993	.2499	.3714	1.4702		1.0009
18	.9745	1.0456	-.0000	.9997	.5004	.6098	1.1207		.9995
17	.9485	1.0488	-.0000	.9999	.4965	.6082	1.1236		.9995
16	.9219	1.0499	-.0000	1.0000	.4979	.6077	1.1245		.9995
15	.8943	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9995
14	.8658	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9995
13	.8365	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
12	.8061	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
11	.7745	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
10	.7415	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
9	.7069	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
4	.2058	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
3	.1678	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
2	.1179	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9995

X/R = .0004

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0001	1.5581	.2447	.9986	.2499	.3713	1.4692		1.0019
18	.9745	1.0550	.0018	.9993	.4946	.6046	1.1289		.9991
17	.9445	1.0477	-.0000	.9998	.4992	.6088	1.1225		.9990
16	.9219	1.0498	-.0000	1.0000	.4980	.6077	1.1244		.9990
15	.8943	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9990
14	.8658	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9990
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9990
12	.8061	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
11	.7745	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
10	.7415	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
9	.7069	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
4	.2058	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
3	.1678	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9990
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9990
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		

X/R = .0006

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0001	1.5576	.2467	.9979	.2499	.3712	1.4682		1.0028
18	.9745	1.0627	.0036	.9990	.4898	.6004	1.1357		.9986
17	.9485	1.0466	-.0000	.9997	.4998	.6093	1.1215		.9985
16	.9219	1.0497	-.0000	1.0000	.4980	.6078	1.1243		.9985
15	.8943	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9985
14	.8658	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9985
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9985
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9985
11	.7745	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
10	.7415	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
9	.7069	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
4	.2058	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
3	.1678	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9985
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9985

X/R = .0010

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0002	1.5566	.2505	.9965	.2499	.3711	1.4663		1.0046
18	.9745	1.0768	.0072	.9983	.4811	.5927	1.1479		.9977
17	.9485	1.0445	.0001	.9995	.5010	.6103	1.1197		.9975
16	.9219	1.0495	-.0000	1.0000	.4982	.6079	1.1241		.9975
15	.8943	1.0500	-.0000	1.0000	.4979	.6077	1.1245		.9975
14	.8658	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9975
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9975
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9975
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9975
10	.7415	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
9	.7069	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
4	.2058	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9975
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9975
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9975

X/R = .0016

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0004	1.5552	.2542	.9944	.2499	.3708	1.4641		1.0074
18	.9745	1.0944	.0124	.9973	.4703	.5830	1.1630		.9964
17	.9485	1.0418	.0003	.9993	.5024	.6115	1.1174		.9960
16	.9219	1.0492	-.0001	.9999	.4983	.6080	1.1239		.9960
15	.8943	1.0500	-.0000	1.0000	.4979	.6077	1.1245		.9960
14	.8658	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
9	.7069	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9960
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9960

X/R = .0020

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0005	1.5542	.2574	.9930	.2499	.3707	1.4624		1.0092
18	.9745	1.1037	.0156	.9966	.4646	.5778	1.1709		.9956
17	.9485	1.0407	.0006	.9991	.5030	.6120	1.1163		.9950
16	.9219	1.0490	-.0001	.9999	.4984	.6081	1.1237		.9950
15	.8943	1.0499	-.0000	1.0000	.4979	.6077	1.1245		.9950
14	.8658	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
5	.2392	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9950
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9950

X/R = .0040

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0010	1.5495	.2674	.9861	.2499	.3700	1.4558		1.0184
18	.9746	1.1498	.0329	.9932	.4370	.5525	1.2092		.9915
17	.9485	1.0389	.0025	.9982	.5036	.6123	1.1148		.9902
16	.9219	1.0481	-.0004	.9998	.4989	.6085	1.1229		.9903
15	.8943	1.0498	-.0000	1.0000	.4980	.6077	1.1244		.9903
14	.8658	1.0500	-.0000	1.0000	.4979	.6077	1.1245		.9903
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
8	.6706	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9903
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9903

X/R = .0080

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U- VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0021	1.5398	.2825	.9722	.2499	.3685	1.4440		1.0364
18	.9748	1.2140	.0627	.9864	.3994	.5171	1.2599		.9839
17	.9486	1.0647	.0115	.9963	.4873	.5978	1.1373		.9813
16	.9219	1.0481	-.0007	.9997	.4989	.6085	1.1229		.9811
15	.8943	1.0492	-.0002	1.0000	.4983	.6080	1.1239		.9812
14	.8658	1.0499	-.0000	1.0000	.4979	.6077	1.1245		.9812
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
8	.6706	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9812
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9812

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0033	1.5299	.2927	.9583	.2499	.3669	1.4338		1.0542
18	.9751	1.2563	.0855	.9796	.3750	.4934	1.2912		.9768
17	.9486	1.0997	.0235	.9945	.4660	.5787	1.1673		.9731
16	.9219	1.0595	.0017	.9995	.4920	.6024	1.1329		.9726
15	.8943	1.0485	-.0003	1.0000	.4987	.6084	1.1233		.9726
14	.8659	1.0497	-.0001	1.0000	.4980	.6078	1.1243		.9726
13	.8365	1.0500	-.0000	1.0000	.4979	.6077	1.1245		.9726
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
8	.6706	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
7	.6322	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726
5	.2382	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9726
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9726

X/R = .0160

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0044	1.5199	.3002	.9444	.2499	.3654	1.4245		1.0716
18	.9755	1.2893	.1047	.9728	.3562	.4746	1.3144		.9702
17	.9488	1.1310	.0356	.9927	.4473	.5617	1.1934		.9657
16	.9219	1.0785	.0064	.9994	.4807	.5925	1.1493		.9648
15	.8943	1.0513	.0005	1.0000	.4971	.6069	1.1257		.9646
14	.8658	1.0493	-.0002	1.0000	.4983	.6080	1.1240		.9646
13	.8365	1.0499	-.0000	1.0000	.4979	.6077	1.1245		.9646
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
8	.6706	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
7	.6322	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
6	.5914	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646
6	.2669	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
5	.2382	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9646
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9646

X/R = .0200

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0056	1.5097	.3059	.9305	.2499	.3639	1.4157		1.0888
18	.9760	1.3166	.1212	.9660	.3408	.4590	1.3327		.9640
17	.9489	1.1597	.0475	.9909	.4305	.5462	1.2167		.9588
16	.9220	1.0990	.0122	.9992	.4686	.5818	1.1669		.9575
15	.8943	1.0591	.0027	1.0000	.4924	.6029	1.1325		.9570
14	.8658	1.0500	-.0000	1.0000	.4978	.6076	1.1246		.9570
13	.8365	1.0497	-.0001	1.0000	.4980	.6078	1.1243		.9570
12	.8061	1.0500	-.0000	1.0000	.4979	.6077	1.1245		.9570
11	.7745	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
8	.6706	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
7	.6322	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
6	.5914	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
5	.5476	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570
4	.4998	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570
8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570
6	.2669	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
5	.2382	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9570
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9570

X/R = .0300

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0088	1.4834	.3157	.8957	.2499	.3599	1.3947		1.1306
18	.9774	1.3687	.1542	.9490	.3116	.4283	1.3651		.9500
17	.9496	1.2226	.0760	.9863	.3948	.5129	1.2656		.9436
16	.9222	1.1500	.0291	.9988	.4393	.5555	1.2096		.9413
15	.8944	1.0900	.0122	.9999	.4741	.5868	1.1593		.9402
14	.8658	1.0630	.0032	1.0000	.4901	.6009	1.1359		.9399
13	.8365	1.0518	.0005	1.0000	.4968	.6067	1.1261		.9398
12	.8061	1.0499	-.0000	1.0000	.4979	.6077	1.1245		.9398
11	.7745	1.0499	-.0000	1.0000	.4979	.6077	1.1245		.9398
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
8	.6706	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
7	.6322	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
6	.5914	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
5	.5476	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
4	.4998	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9398
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9398
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9398

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9398
7	.2919	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
6	.2662	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
5	.2382	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9398
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9398

X/R = .0340

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0100	1.4725	.3185	.8818	.2499	.3583	1.3865		1.1469
18	.9780	1.3848	.1649	.9422	.3025	.4185	1.3744		.9448
17	.9499	1.2449	.0867	.9845	.3827	.5013	1.2822		.9382
16	.9223	1.1697	.0363	.9987	.4283	.5455	1.2255		.9356
15	.8944	1.1041	.0169	.9999	.4659	.5795	1.1712		.9342
14	.8658	1.0720	.0056	1.0000	.4848	.5962	1.1437		.9337
13	.8365	1.0552	.0013	1.0000	.4948	.6049	1.1291		.9336
12	.8061	1.0505	.0001	1.0000	.4976	.6074	1.1250		.9335
11	.7745	1.0499	-.0000	1.0000	.4979	.6077	1.1245		.9335
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1245		.9335
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
8	.6706	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
7	.6322	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
6	.5914	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
5	.5476	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
4	.4998	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
3	.4468	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9335
2	.3871	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9335
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9335

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9335
7	.2919	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
6	.2669	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
5	.2382	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9335
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9335

X/R = .0400

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0120	1.4558	.3223	.8610	.2499	.3559	1.3739		1.1709
18	.9790	1.4052	.1790	.9320	.2907	.4055	1.3857		.9376
17	.9505	1.2756	.1019	.9817	.3662	.4854	1.3042		.9307
16	.9226	1.1981	.0473	.9964	.4127	.5312	1.2482		.9277
15	.8946	1.1256	.0246	.9999	.4536	.5685	1.1892		.9259
14	.8659	1.0875	.0101	1.0000	.4756	.5881	1.1571		.9251
13	.8365	1.0634	.0035	1.0000	.4899	.6007	1.1363		.9248
12	.8061	1.0531	.0008	1.0000	.4960	.6060	1.1273		.9247
11	.7745	1.0503	.0001	1.0000	.4977	.6075	1.1248		.9247
10	.7415	1.0500	-.0000	1.0000	.4979	.6077	1.1245		.9247
9	.7069	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
8	.6706	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
7	.6322	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
6	.5914	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
5	.5476	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
4	.4998	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
3	.4468	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
2	.3871	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9247

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9247
7	.2919	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
6	.2669	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
5	.2382	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
2	.1179	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.9247
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.9247

X/R = .0800

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0254	1.3304	.3514	.7219	.2499	.3384	1.2763		1.3199
18	.9870	1.4727	.2350	.8630	.2448	.3510	1.4166		.9004
17	.9563	1.4237	.1806	.9635	.2928	.4115	1.3983		.8919
16	.9259	1.3575	.1173	.9969	.3324	.4550	1.3636		.8882
15	.8967	1.2627	.0824	.9999	.3795	.5005	1.2966		.8844
14	.8671	1.2030	.0513	1.0000	.4108	.5296	1.2519		.8818
13	.8372	1.1520	.0332	1.0000	.4387	.5552	1.2110		.8802
12	.8065	1.1174	.0199	1.0000	.4583	.5728	1.1824		.8792
11	.7747	1.0910	.0115	1.0000	.4736	.5864	1.1601		.8786
10	.7415	1.0724	.0059	1.0000	.4845	.5960	1.1441		.8783
9	.7069	1.0601	.0026	1.0000	.4919	.6024	1.1334		.8781
8	.6706	1.0534	.0008	1.0000	.4958	.6059	1.1276		.8781
7	.6322	1.0508	.0002	1.0000	.4974	.6072	1.1253		.8781
6	.5914	1.0501	.0000	1.0000	.4978	.6076	1.1247		.8781
5	.5476	1.0500	.0000	1.0000	.4979	.6076	1.1246		.8781
4	.4998	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
3	.4468	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
2	.3871	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
1	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8781

8	.3162	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8781
7	.2919	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
6	.2669	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
5	.2382	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8781
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8781

X/R = .1200

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
19	1.0405	1.1679	.4160	.5829	.2499	.3184	1.1324		1.4536
18	.9971	1.4963	.2535	.7959	.2180	.3156	1.4263		.8784
17	.9647	1.5049	.2320	.9452	.2557	.3715	1.4390		.8650
16	.9317	1.4753	.1715	.9953	.2809	.4033	1.4361		.8616
15	.9012	1.3778	.1369	.9998	.3241	.4472	1.3751		.8573
14	.8701	1.3118	.0970	1.0000	.3552	.4774	1.3325		.8536
13	.8393	1.2863	.0720	1.0000	.3880	.5085	1.2847		.8509
12	.8079	1.2001	.0504	1.0000	.4123	.5311	1.2496		.8489
11	.7756	1.1607	.0356	1.0000	.4339	.5508	1.2181		.8476
10	.7421	1.1306	.0243	1.0000	.4508	.5660	1.1934		.8466
9	.7073	1.1062	.0161	1.0000	.4648	.5785	1.1730		.8460
8	.6708	1.0869	.0101	1.0000	.4760	.5884	1.1566		.8456
7	.6323	1.0719	.0057	1.0000	.4848	.5962	1.1437		.8454
6	.5914	1.0611	.0028	1.0000	.4912	.6019	1.1343		.8452
5	.5476	1.0545	.0011	1.0000	.4952	.6053	1.1285		.8452
4	.4998	1.0513	.0003	1.0000	.4971	.6070	1.1257		.8451
3	.4468	1.0503	.0001	1.0000	.4977	.6075	1.1248		.8451
2	.3871	1.0500	.0000	1.0000	.4978	.6076	1.1246		.8451
1	.3162	1.0500	.0000	1.0000	.4978	.6076	1.1246		.8451

8	.3162	1.0500	.0000	1.0000	.4978	.6076	1.1246		.8451
7	.2919	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8451
6	.2669	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8451
5	.2382	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8451
4	.2058	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8451
3	.1678	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8451
2	.1174	1.0500	-.0000	1.0000	.4979	.6077	1.1246		.8451
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8451

X/R = .1600

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.0171	1.1000	.1462	.5337	.2499	.3104	1.1556		1.5761
17	.9749	1.5392	.2751	.9269	.2385	.3515	1.4464		.8447
16	.9393	1.5681	.2086	.9937	.2451	.3656	1.4871		.8415
15	.9076	1.4704	.1832	.9997	.2842	.4071	1.4299		.8375
14	.[illegible]48	1.4078	.1392	1.0000	.3108	.4340	1.3962		.8333
13	.[illegible]30	1.3342	.1115	1.0000	.3444	.4670	1.3473		.8299
12	.[illegible]06	1.2818	.0837	1.0000	.3699	.4915	1.3112		.8272
11	.7776	1.2328	.0642	1.0000	.3950	.5151	1.2747		.8252
10	.7435	1.1948	.0478	1.0000	.4152	.5337	1.2455		.8237
9	.7083	1.1621	.0354	1.0000	.4331	.5500	1.2194		.8225
8	.6715	1.1356	.0256	1.0000	.4480	.5635	1.1976		.8217
7	.6328	1.1132	.0181	1.0000	.4607	.5749	1.1789		.8211
6	.5917	1.0945	.0121	1.0000	.4715	.5845	1.1631		.8207
5	.5478	1.0790	.0075	1.0000	.4806	.5926	1.1498		.8204
4	.4999	1.0666	.0041	1.0000	.4860	.5990	1.1390		.8202
3	.4468	1.0578	.0019	1.0000	.4932	.6036	1.1314		.8201
2	.3871	1.0525	.0006	1.0000	.4964	.6063	1.1268		.8201
1	.3162	1.0516	.0004	1.0000	.4969	.6068	1.1260		.8201

8	.3162	1.0516	.0004	1.0000	.4969	.6068	1.1260		.8201
7	.2919	1.0507	.0002	1.0000	.4974	.6073	1.1252		.8201
6	.2669	1.0504	.0001	1.0000	.4977	.6075	1.1249		.8201
5	.2382	1.0501	.0000	1.0000	.4978	.6076	1.1247		.8201
4	.2058	1.0500	.0000	1.0000	.4978	.6076	1.1246		.8201
3	.1678	1.0500	.0000	1.0000	.4979	.6076	1.1246		.8201
2	.1174	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8201
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246		.8201

A SHOCK HAS BEEN DETECTED AT X= .1644 Y = .9970

X/R = .1644

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U- VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.0178	1.3288	.1772	.7203	.2499	.3382	1.3309		1.5890
	.9970	.0000	.1772*00000000.0000		.2499	.3382	1.3309	.0000	.8447
	.9970	.0000	.2741*00000000.0000		.2400	.3528	1.4431	.0000	.8447
17	.9761	1.5335	.2741	.9240	.2400	.3528	1.4431		.8439
16	.9402	1.5776	.2116	.9935	.2416	.3619	1.4922		.8396
15	.9085	1.4793	.1878	.9997	.2806	.4034	1.4347		.8357
14	.8754	1.4176	.1435	1.0000	.3065	.4297	1.4023		.8319
13	.8435	1.3439	.1157	1.0000	.3401	.4628	1.3535		.8279
12	.8110	1.2906	.0874	1.0000	.3655	.4873	1.3176		.8252
11	.7779	1.2406	.0675	1.0000	.3909	.5112	1.2807		.8231
10	.7438	1.2020	.0505	1.0000	.4113	.5302	1.2511		.8215
9	.7084	1.1685	.0378	1.0000	.4295	.5468	1.2245		.8203
8	.6716	1.1412	.0276	1.0000	.4448	.5606	1.2023		.8195
7	.6328	1.1182	.0197	1.0000	.4579	.5724	1.1831		.8188
6	.5917	1.0988	.0134	1.0000	.4690	.5823	1.1668		.8184
5	.5478	1.0826	.0086	1.0000	.4785	.5907	1.1529		.8180
4	.4999	1.0694	.0049	1.0000	.4863	.5975	1.1415		.8178
3	.4468	1.0596	.0023	1.0000	.4921	.6026	1.1330		.8177
2	.3871	1.0533	.0008	1.0000	.4959	.6059	1.1275		.8177
1	.3162	1.0519	.0005	1.0000	.4968	.6067	1.1262		.8177

8	.3162	1.0519	.0005	1.0000	.4968	.6067	1.1262	.8177
7	.2912	1.0513	.0003	1.0000	.4971	.6070	1.1257	.8177
6	.2669	1.0505	.0001	1.0000	.4975	.6074	1.1250	.8177
5	.2382	1.0502	.0001	1.0000	.4977	.6075	1.1248	.8177
4	.2058	1.0501	.0000	1.0000	.4978	.6076	1.1246	.8177
3	.1678	1.0500	.0000	1.0000	.4979	.6076	1.1246	.8177
2	.1174	1.0500	.0000	1.0000	.4979	.6077	1.1246	.8177
1	.0000	1.0500	.0000	1.0000	.4979	.6077	1.1246	.8177

XSHOCK =	.168844	YSHOCK =	.994235	P2 =	.311054	P1 =	.239980	MACH2 =	1.350	MACH1 =	1.533
XSHOCK =	.173295	YSHOCK =	.991537	P2 =	.302926	P1 =	.239442	MACH2 =	1.369	MACH1 =	1.535
XSHOCK =	.177778	YSHOCK =	.988889	P2 =	.294647	P1 =	.238303	MACH2 =	1.388	MACH1 =	1.537
XSHOCK =	.182301	YSHOCK =	.986281	P2 =	.286266	P1 =	.236063	MACH2 =	1.407	MACH1 =	1.542
XSHOCK =	.186872	YSHOCK =	.983700	P2 =	.276938	P1 =	.231842	MACH2 =	1.428	MACH1 =	1.551
XSHOCK =	.191497	YSHOCK =	.981152	P2 =	.268637	P1 =	.225804	MACH2 =	1.453	MACH1 =	1.573
XSHOCK =	.196185	YSHOCK =	.978665	P2 =	.256619	P1 =	.222983	MACH2 =	1.492	MACH1 =	1.588
XSHOCK =	.200000	YSHOCK =	.976693	P2 =	.254054	P1 =	.221040	MACH2 =	1.504	MACH1 =	1.599

X/R = .2000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.0266	1.2641	.2881	.6598	.2499	.3298	1.2512		1.6897
17	.9852	1.4815	.2120	.9082	.2541	.3656	1.4295		.8534
	.9767	1.5039	.2047	.9308	.2541	.3690	1.4465	-.5150	.8376
	.9767	1.5990	.2563	.9310	.2210	.3341	1.4908	-.5150	.8272
16	.9081	1.6346	.2321	.9922	.2217	.3402	1.5210		.8258
15	.9158	1.5417	.2219	.9996	.2563	.3781	1.4661		.8220
14	.8911	1.4922	.1750	1.0000	.2755	.3981	1.4467		.8175
13	.8482	1.4136	.1486	1.0000	.3083	.4315	1.3984		.8139
12	.8146	1.3593	.1165	1.0000	.3327	.4556	1.3651		.8107
11	.7808	1.3032	.0941	1.0000	.3594	.4814	1.3264		.8082
10	.7460	1.2598	.0733	1.0000	.3810	.5020	1.2952		.8061
9	.7101	1.2203	.0575	1.0000	.4016	.5211	1.2653		.8046
8	.6729	1.1878	.0442	1.0000	.4190	.5372	1.2400		.8033
7	.6338	1.1596	.0336	1.0000	.4345	.5513	1.2173		.8024
6	.5924	1.1356	.0250	1.0000	.4480	.5635	1.1976		.8017
5	.5483	1.1148	.0181	1.0000	.4598	.5741	1.1802		.8011
4	.5002	1.0966	.0124	1.0000	.4703	.5835	1.1649		.8007
3	.4470	1.0810	.0079	1.0000	.4794	.5915	1.1515		.8004
2	.3871	1.0662	.0039	1.0000	.4882	.5992	1.1387		.8002
1	.3163	1.0607	.0029	1.0000	.4915	.6021	1.1339		.8001

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
8	.3163	1.0607	.0022	1.0000	.4915	.6021	1.1339		.8001
7	.2919	1.0586	.0019	1.0000	.4927	.6032	1.1321		.8001
6	.2669	1.0560	.0014	1.0000	.4943	.6045	1.1298		.8001
5	.2382	1.0541	.0009	1.0000	.4954	.6055	1.1281		.8001
4	.2058	1.0524	.0005	1.0000	.4965	.6064	1.1266		.8001
3	.1678	1.0511	.0002	1.0000	.4972	.6071	1.1255		.8001
2	.1174	1.0503	.0001	1.0000	.4977	.6075	1.1249		.8001
1	.0000	1.0501	.0000	1.0000	.4978	.6076	1.1246		.8001

XSHOCK =	.204835	YSHOCK =	.974219	P2 =	.250487	P1 =	.218955	MACH2 =	1.520	MACH1 =	1.612
XSHOCK =	.209746	YSHOCK =	.971738	P2 =	.247523	P1 =	.217275	MACH2 =	1.534	MACH1 =	1.622
XSHOCK =	.214743	YSHOCK =	.969241	P2 =	.245201	P1 =	.216016	MACH2 =	1.546	MACH1 =	1.632
XSHOCK =	.219835	YSHOCK =	.966715	P2 =	.243825	P1 =	.215204	MACH2 =	1.554	MACH1 =	1.639
XSHOCK =	.225031	YSHOCK =	.964158	P2 =	.243010	P1 =	.214863	MACH2 =	1.561	MACH1 =	1.645
XSHOCK =	.230335	YSHOCK =	.961573	P2 =	.242937	P1 =	.215096	MACH2 =	1.566	MACH1 =	1.648
XSHOCK =	.235756	YSHOCK =	.958944	P2 =	.244211	P1 =	.216364	MACH2 =	1.564	MACH1 =	1.647
XSHOCK =	.240000	YSHOCK =	.956896	P2 =	.244994	P1 =	.217044	MACH2 =	1.564	MACH1 =	1.646

X/R = .2400

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.0365	1.2467	.2212	.6446	.2499	.3276	1.2580		1.7173
17	.9936	1.5136	.2077	.8898	.2376	.3465	1.4521		.8541
16	.9577	1.5718	.2101	.9858	.2418	.3613	1.4890		.8217
	.9569	1.5638	.2078	.9860	.2450	.3648	1.4846	-.4803	.8227
	.9569	1.6455	.2522	.9862	.2170	.3346	1.5206	-.4803	.8138
15	.9253	1.6002	.2482	.9989	.2350	.3553	1.4944		.8083
14	.8887	1.5645	.2043	.9998	.2479	.3692	1.4860		.8039
13	.8549	1.4838	.1822	1.0000	.2788	.4016	1.4392		.8002
12	.8199	1.4315	.1472	1.0000	.3005	.4237	1.4113		.7967
11	.7852	1.3704	.1235	1.0000	.3275	.4506	1.3721		.7938
10	.7494	1.3236	.0994	1.0000	.3495	.4719	1.3411		.7914
9	.7129	1.2786	.0808	1.0000	.3715	.4930	1.3090		.7895
8	.6750	1.2414	.0643	1.0000	.3905	.5109	1.2816		.7879
7	.6355	1.2080	.0510	1.0000	.4081	.5272	1.2559		.7866
6	.5937	1.1794	.0398	1.0000	.4236	.5414	1.2333		.7855
5	.5492	1.1541	.0306	1.0000	.4375	.5541	1.2129		.7847
4	.5009	1.1315	.0228	1.0000	.4503	.5656	1.1943		.7841
3	.4475	1.1124	.0168	1.0000	.4612	.5753	1.1782		.7836
2	.3874	1.0908	.0103	1.0000	.4737	.5864	1.1599		.7831
1	.3165	1.0802	.0084	1.0000	.4799	.5919	1.1508		.7829
8	.3165	1.0902	.0084	1.0000	.4799	.5919	1.1508		.7829
7	.2921	1.0776	.0062	1.0000	.4814	.5933	1.1486		.7829
6	.2671	1.0726	.0053	1.0000	.4844	.5959	1.1443		.7828
5	.2383	1.0685	.0041	1.0000	.4868	.5980	1.1407		.7828
4	.2059	1.0641	.0031	1.0000	.4894	.6003	1.1369		.7827
3	.1678	1.0599	.0021	1.0000	.4919	.6025	1.1333		.7827
2	.1175	1.0556	.0010	1.0000	.4945	.6047	1.1295		.7826
1	.0000	1.0541	.0000	1.0000	.4954	.6055	1.1282		.7826

XSHOCK =	.245662	YSHOCK =	.954193	P2 =	.244702	P1 =	.219048	MACH2 =	1.566	MACH1 =	1.641
XSHOCK =	.251445	YSHOCK =	.951469	P2 =	.245757	P1 =	.220361	MACH2 =	1.565	MACH1 =	1.639
XSHOCK =	.257359	YSHOCK =	.948686	P2 =	.246338	P1 =	.221007	MACH2 =	1.564	MACH1 =	1.638
XSHOCK =	.263413	YSHOCK =	.945946	P2 =	.245949	P1 =	.220988	MACH2 =	1.567	MACH1 =	1.639
XSHOCK =	.269614	YSHOCK =	.942953	P2 =	.245003	P1 =	.220332	MACH2 =	1.570	MACH1 =	1.642
XSHOCK =	.275966	YSHOCK =	.939998	P2 =	.243519	P1 =	.219035	MACH2 =	1.575	MACH1 =	1.646
XSHOCK =	.282475	YSHOCK =	.936977	P2 =	.241585	P1 =	.217325	MACH2 =	1.581	MACH1 =	1.652
XSHOCK =	.289146	YSHOCK =	.933888	P2 =	.239815	P1 =	.215816	MACH2 =	1.586	MACH1 =	1.657
XSHOCK =	.295985	YSHOCK =	.930731	P2 =	.237822	P1 =	.214387	MACH2 =	1.592	MACH1 =	1.661
XSHOCK =	.302996	YSHOCK =	.927505	P2 =	.236229	P1 =	.213264	MACH2 =	1.596	MACH1 =	1.665
XSHOCK =	.310184	YSHOCK =	.924214	P2 =	.235040	P1 =	.212450	MACH2 =	1.600	MACH1 =	1.668
XSHOCK =	.317555	YSHOCK =	.920852	P2 =	.234244	P1 =	.211942	MACH2 =	1.602	MACH1 =	1.669
XSHOCK =	.325110	YSHOCK =	.917412	P2 =	.233824	P1 =	.211735	MACH2 =	1.604	MACH1 =	1.670
XSHOCK =	.332839	YSHOCK =	.913907	P2 =	.233203	P1 =	.211951	MACH2 =	1.604	MACH1 =	1.670

XSHOCK =	.340743	YSHOCK =	.910334	P2 =	.233900	P1 =	.212133	MACH2 =	1.604	MACH1 =	1.669
XSHOCK =	.348829	YSHOCK =	.906685	P2 =	.234523	P1 =	.212098	MACH2 =	1.602	MACH1 =	1.669
XSHOCK =	.357099	YSHOCK =	.902961	P2 =	.233737	P1 =	.211728	MACH2 =	1.604	MACH1 =	1.670
XSHOCK =	.365560	YSHOCK =	.899167	P2 =	.232757	P1 =	.211043	MACH2 =	1.607	MACH1 =	1.673
XSHOCK =	.374213	YSHOCK =	.895308	P2 =	.231428	P1 =	.210094	MACH2 =	1.611	MACH1 =	1.676
XSHOCK =	.383066	YSHOCK =	.891387	P2 =	.229725	P1 =	.208963	MACH2 =	1.617	MACH1 =	1.679
XSHOCK =	.392120	YSHOCK =	.887395	P2 =	.228285	P1 =	.207988	MACH2 =	1.621	MACH1 =	1.683
XSHOCK =	.400000	YSHOCK =	.883914	P2 =	.228901	P1 =	.207199	MACH2 =	1.618	MACH1 =	1.685

X/R = .4000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.0705	1.1711	.2095	.5838	.2499	.3185	1.2015		1.8235
17	1.0261	1.4325	.1950	.8162	.2450	.3455	1.4008		.8631
16	.9911	1.5540	.1903	.9611	.2420	.3589	1.4833		.7793
15	.9612	1.5945	.2041	.9958	.2362	.3563	1.5051		.7681
14	.9251	1.6161	.2214	.9992	.2295	.3494	1.5131		.7636
13	.8910	1.6213	.2207	.9999	.2279	.3478	1.5165		.7598
	.8839	1.6185	.2198	.9998	.2289	.3488	1.5151	-.4433	.7591
	.8839	1.6850	.2561	.9999	.2072	.3249	1.5425	-.4433	.7524
12	.8510	1.6510	.2395	1.0000	.2181	.3369	1.5283		.7504
11	.8133	1.5997	.2197	1.0000	.2354	.3558	1.5036		.7472
10	.7731	1.5525	.1925	1.0000	.2523	.3740	1.4817		.7441
9	.7332	1.4980	.1701	1.0000	.2732	.3958	1.4517		.7413
8	.6920	1.4513	.1461	1.0000	.2922	.4153	1.4253		.7387
7	.6496	1.4048	.1258	1.0000	.3121	.4353	1.3964		.7365
6	.6054	1.3632	.1064	1.0000	.3309	.4538	1.3694		.7344
5	.5588	1.3246	.0899	1.0000	.3490	.4714	1.3431		.7326
4	.5085	1.2882	.0742	1.0000	.3667	.4884	1.3171		.7310
3	.4537	1.2570	.0616	1.0000	.3825	.5033	1.2940		.7296
2	.3920	1.2234	.0480	1.0000	.3999	.5196	1.2685		.7282
1	.3202	1.2006	.0400	1.0000	.4120	.5308	1.2506		.7273

8	.3202	1.2006	.0400	1.0000	.4120	.5308	1.2506		.7273
7	.2950	1.2011	.0325	1.0000	.4118	.5306	1.2513		.7271
6	.2628	1.1913	.0298	1.0000	.4171	.5355	1.2435		.7269
5	.2406	1.1848	.0259	1.0000	.4206	.5387	1.2383		.7266
4	.2078	1.1776	.0221	1.0000	.4245	.5423	1.2326		.7263
3	.1694	1.1704	.0175	1.0000	.4285	.5459	1.2268		.7260
2	.1186	1.1649	.0130	1.0000	.4315	.5487	1.2223		.7257
1	.0000	1.1631	.0000	1.0000	.4326	.5496	1.2209		.7256

XSHOCK =	.409449	YSHOCK =	.879738	P2 =	.227128	P1 =	.206361	MACH2 =	1.624	MACH1 = 1.688
XSHOCK =	.419123	YSHOCK =	.875487	P2 =	.226015	P1 =	.205617	MACH2 =	1.627	MACH1 = 1.690
XSHOCK =	.429015	YSHOCK =	.871157	P2 =	.225177	P1 =	.204966	MACH2 =	1.629	MACH1 = 1.692
XSHOCK =	.439128	YSHOCK =	.866749	P2 =	.224427	P1 =	.204422	MACH2 =	1.632	MACH1 = 1.694
XSHOCK =	.449467	YSHOCK =	.862261	P2 =	.223584	P1 =	.203851	MACH2 =	1.634	MACH1 = 1.696
XSHOCK =	.460038	YSHOCK =	.857675	P2 =	.224363	P1 =	.203030	MACH2 =	1.632	MACH1 = 1.699
XSHOCK =	.470848	YSHOCK =	.852997	P2 =	.222264	P1 =	.202078	MACH2 =	1.638	MACH1 = 1.702
XSHOCK =	.481903	YSHOCK =	.848231	P2 =	.220851	P1 =	.201003	MACH2 =	1.642	MACH1 = 1.705
XSHOCK =	.493209	YSHOCK =	.843391	P2 =	.219339	P1 =	.199906	MACH2 =	1.648	MACH1 = 1.709
XSHOCK =	.500000	YSHOCK =	.840504	P2 =	.218610	P1 =	.199276	MACH2 =	1.649	MACH1 = 1.711

X/R = .5000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
									1.7974
18	1.0897	1.1025	.1860	.5629	.2499	.3152	1.1835		.8790
17	1.0450	1.3990	.1838	.7831	.2463	.3427	1.3805		.7623
16	1.0099	1.5356	.1848	.9372	.2429	.3568	1.4728		.7444
15	.9806	1.5796	.1833	.9903	.2401	.3599	1.5015		.7397
14	.9458	1.6001	.1909	.9979	.2348	.3550	1.5123		.7361
13	.9128	1.6325	.2105	.9996	.2241	.3435	1.5266		.7333
12	.8749	1.6512	.2244	.9999	.2180	.3368	1.5335		
	.8405	1.6495	.2232	.9999	.2186	.3376	1.5329	-.4254	.7318
	.8405	1.7109	.2567	1.0000	.1993	.3159	1.5573	-.4254	.7259
11	.8371	1.7018	.2518	1.0000	.2020	.3191	1.5538		.7245
10	.7946	1.6646	.2350	1.0000	.2137	.3321	1.5380		.7215
9	.7526	1.6176	.2143	1.0000	.2292	.3491	1.5163		.7186
8	.7088	1.5709	.1905	1.0000	.2456	.3668	1.4940		.7159
7	.6644	1.5221	.1688	1.0000	.2638	.3860	1.4680		.7133
6	.6181	1.4769	.1467	1.0000	.2817	.4045	1.4427		.7109
5	.5697	1.4337	.1271	1.0000	.2996	.4228	1.4167		.7087
4	.5177	1.3927	.1077	1.0000	.3175	.4406	1.3907		.7066
3	.4613	1.3566	.0911	1.0000	.3339	.4568	1.3667		.7049
2	.3981	1.3182	.0727	1.0000	.3521	.4744	1.3401		.7029
1	.3252	1.2929	.0621	1.0000	.3644	.4863	1.3218		.7016
8	.3252	1.2929	.0621	1.0000	.3644	.4863	1.3218		.7016
7	.2990	1.2943	.0493	1.0000	.3637	.4856	1.3238		.7014
6	.2736	1.2820	.0455	1.0000	.3698	.4914	1.3146		.7011
5	.2439	1.2748	.0397	1.0000	.3734	.4948	1.3094		.7007
4	.2106	1.2667	.0341	1.0000	.3775	.4987	1.3033		.7003
3	.1716	1.2578	.0271	1.0000	.3821	.5030	1.2966		.6999
2	.1202	1.2517	.0204	1.0000	.3852	.5059	1.2921		.6995
1	.0000	1.2497	.0000	1.0000	.3862	.5068	1.2908		.6994

XSHOCK	=	.511738	YSHOCK =	.835523	P2 =	.217463	P1 =	.198414	MACH2 =	1.653	MACH1 =	1.714
XSHOCK	=	.523773	YSHOCK =	.830422	P2 =	.217586	P1 =	.197416	MACH2 =	1.652	MACH1 =	1.717
XSHOCK	=	.536079	YSHOCK =	.825216	P2 =	.215732	P1 =	.196392	MACH2 =	1.658	MACH1 =	1.721
XSHOCK	=	.548653	YSHOCK =	.819932	P2 =	.214352	P1 =	.195329	MACH2 =	1.662	MACH1 =	1.724
XSHOCK	=	.561499	YSHOCK =	.814569	P2 =	.212507	P1 =	.194266	MACH2 =	1.668	MACH1 =	1.728
XSHOCK	=	.574628	YSHOCK =	.809132	P2 =	.211197	P1 =	.193231	MACH2 =	1.673	MACH1 =	1.731
XSHOCK	=	.588051	YSHOCK =	.803584	P2 =	.211000	P1 =	.191939	MACH2 =	1.673	MACH1 =	1.736
XSHOCK	=	.600000	YSHOCK =	.798636	P2 =	.209493	P1 =	.190770	MACH2 =	1.677	MACH1 =	1.740

X/R = .6000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.1079	1.1123	.1748	.5419	.2499	.3118	1.1608		1.7709
17	1.0627	1.3685	.1680	.7500	.2463	.3386	1.3620		.9013
16	1.0275	1.5205	.1673	.9134	.2415	.3532	1.4673		.7550
15	.9983	1.5861	.1733	.9847	.2365	.3555	1.5082		.7256
14	.9640	1.5966	.1764	.9966	.2357	.3558	1.5140		.7198
13	.9323	1.6057	.1794	.9994	.2332	.3534	1.5190		.7166
12	.8961	1.6388	.1971	.9999	.2221	.3413	1.5345		.7140
11	.8593	1.6739	.2175	.9999	.2107	.3288	1.5493		.7112
10	.8183	1.6814	.2243	.9999	.2063	.3261	1.5515		.7084
	.7986	1.6770	.2227	.9999	.2095	.3273	1.5495	-.4139	.7084
	.7986	1.7398	.2561	1.0000	.1908	.3063	1.5739	-.4139	.7023
9	.7756	1.7169	.2450	1.0000	.1975	.3139	1.5650		.7002
8	.7298	1.6769	.2262	1.0000	.2097	.3277	1.5483		.6975
7	.6832	1.6319	.2051	1.0000	.2244	.3439	1.5279		.6949
6	.6346	1.5864	.1823	1.0000	.2401	.3609	1.5061		.6923
5	.5841	1.5417	.1606	1.0000	.2564	.3782	1.4828		.6899
4	.5300	1.4982	.1384	1.0000	.2731	.3957	1.4588		.6875
3	.4718	1.4593	.1186	1.0000	.2889	.4119	1.4359		.6855
2	.4065	1.4171	.0961	1.0000	.3067	.4299	1.4098		.6832
1	.3321	1.3872	.0801	1.0000	.3200	.4431	1.3903		.6816
8	.3321	1.3872	.0801	1.0000	.3200	.4431	1.3903		.6816
7	.3046	1.3912	.0659	1.0000	.3181	.4413	1.3947		.6814
6	.2791	1.3778	.0610	1.0000	.3242	.4473	1.3853		.6811
5	.2486	1.3700	.0536	1.0000	.3278	.4508	1.3802		.6805
4	.2147	1.3602	.0461	1.0000	.3322	.4552	1.3736		.6801
3	.1748	1.3496	.0366	1.0000	.3372	.4600	1.3662		.6795
2	.1226	1.3430	.0279	1.0000	.3402	.4630	1.3617		.6791
1	.0060	1.3409	.0000	1.0000	.3413	.4640	1.3606		.6789

XSHOCK =	.614016	YSHOCK =	.792865	P2 =	.207580	P1 =	.189379	MACH2 =	1.684	MACH1 =	1.745
XSHOCK =	.628365	YSHOCK =	.787027	P2 =	.205925	P1 =	.188045	MACH2 =	1.690	MACH1 =	1.749
XSHOCK =	.643046	YSHOCK =	.781109	P2 =	.204296	P1 =	.186758	MACH2 =	1.695	MACH1 =	1.754
XSHOCK =	.658066	YSHOCK =	.775050	P2 =	.204114	P1 =	.185315	MACH2 =	1.695	MACH1 =	1.759
XSHOCK =	.673433	YSHOCK =	.768861	P2 =	.201513	P1 =	.183804	MACH2 =	1.704	MACH1 =	1.764
XSHOCK =	.680000	YSHOCK =	.766235	P2 =	.200722	P1 =	.183149	MACH2 =	1.706	MACH1 =	1.767

X/R = .6800

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.1205	1.1000	.1577	.5337	.2499	.3104	1.1536		1.7499
17	1.0756	1.3455	.1569	.7296	.2474	.3370	1.3476		.9197
16	1.0405	1.4969	.1556	.8924	.2442	.3536	1.4543		.7544
15	1.0117	1.5738	.1591	.9764	.2388	.3571	1.5039		.7139
14	.9778	1.6043	.1672	.9943	.2325	.3521	1.5212		.7060
13	.9462	1.6124	.1690	.9989	.2307	.3507	1.5258		.7028
12	.9109	1.6177	.1723	.9998	.2291	.3490	1.5283		.7005
11	.8757	1.6505	.1900	.9999	.2182	.3371	1.5436		.6980
10	.8360	1.6939	.2137	.9999	.2045	.3218	1.5623		.6953
9	.7943	1.7090	.2225	.9999	.1999	.3166	1.5682		.6925
	.7662	1.7064	.2221	.9999	.2007	.3176	1.5669	-.3991	.6913
	.7662	1.7666	.2547	1.0000	.1831	.2975	1.5894	-.3991	.6858
8	.7487	1.7487	.2458	1.0000	.1882	.3033	1.5827		.6848
7	.7006	1.7120	.2278	1.0000	.1990	.3156	1.5682		.6823
6	.6501	1.6695	.2062	1.0000	.2121	.3304	1.5502		.6797
5	.5979	1.6258	.1839	1.0000	.2264	.3461	1.5302		.6772
4	.5420	1.5816	.1602	1.0000	.2418	.3627	1.5086		.6747
3	.4821	1.5414	.1386	1.0000	.2565	.3783	1.4874		.6726
2	.4149	1.4968	.1135	1.0000	.2736	.3963	1.4624		.6701
1	.3391	1.4672	.0987	1.0000	.2856	.4085	1.4445		.6682
8	.3391	1.4672	.0987	1.0000	.2856	.4085	1.4445		.6682
7	.3103	1.4712	.0783	1.0000	.2839	.4069	1.4498		.6680
6	.2845	1.4552	.0727	1.0000	.2905	.4136	1.4393		.6677
5	.2532	1.4463	.0635	1.0000	.2943	.4174	1.4341		.6671
4	.2187	1.4365	.0552	1.0000	.2984	.4216	1.4278		.6666
3	.1781	1.4253	.0441	1.0000	.3032	.4264	1.4207		.6660
2	.1251	1.4185	.0336	1.0000	.3062	.4294	1.4164		.6655
1	.0000	1.4162	.0000	1.0000	.3071	.4303	1.4156		.6653

XSHOCK =	.695915	YSHOCK =	.759896	P2 =	.198787	P1 =	.181535	MACH2 =	1.712	MACH1 =	1.772
XSHOCK =	.712268	YSHOCK =	.753416	P2 =	.196710	P1 =	.179940	MACH2 =	1.719	MACH1 =	1.778
XSHOCK =	.729012	YSHOCK =	.746804	P2 =	.196413	P1 =	.178113	MACH2 =	1.721	MACH1 =	1.785
XSHOCK =	.745338	YSHOCK =	.740383	P2 =	.193926	P1 =	.176311	MACH2 =	1.729	MACH1 =	1.792
XSHOCK =	.760803	YSHOCK =	.734339	P2 =	.191683	P1 =	.174582	MACH2 =	1.736	MACH1 =	1.798
XSHOCK =	.775291	YSHOCK =	.728712	P2 =	.189604	P1 =	.173004	MACH2 =	1.744	MACH1 =	1.804
XSHOCK =	.788711	YSHOCK =	.723532	P2 =	.187691	P1 =	.171643	MACH2 =	1.750	MACH1 =	1.809
XSHOCK =	.800000	YSHOCK =	.719178	P2 =	.188293	P1 =	.170369	MACH2 =	1.748	MACH1 =	1.814

X/R = .8000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
18	1.1225	1.1000	.1412	.5337	.2499	.3104	1.1564		1.7179
17	1.0935	1.3128	.1398	.6991	.2479	.3334	1.3266		.9500
16	1.0580	1.4731	.1373	.8610	.2438	.3496	1.4420		.7609
15	1.0294	1.5606	.1375	.9639	.2404	.3574	1.5001		.7010
14	.9964	1.5897	.1420	.9907	.2367	.3563	1.5178		.6883
13	.9657	1.6159	.1516	.9980	.2293	.3491	1.5322		.6846
12	.9307	1.6332	.1590	.9997	.2239	.3433	1.5412		.6823
11	.8963	1.6339	.1579	.9999	.2237	.3431	1.5418		.6802
10	.8589	1.6526	.1669	.9999	.2175	.3364	1.5511		.6781
9	.8196	1.7044	.1934	.9999	.2012	.3182	1.5747		.6754
8	.7757	1.7463	.2148	.9999	.1889	.3041	1.5922		.6734
7	.7287	1.7503	.2159	.9999	.1877	.3028	1.5941		.6711
	.7192	1.7483	.2145	.9999	.1883	.3034	1.5934	-.3865	.6705
	.7192	1.8139	.2495	1.0000	.1704	.2825	1.6172	-.3865	.6646
6	.6766	1.7820	.2324	1.0000	.1789	.2925	1.6061		.6631
5	.6217	1.7452	.2120	1.0000	.1892	.3045	1.5924		.6607
4	.5629	1.7025	.1880	1.0000	.2018	.3188	1.5751		.6581
3	.5004	1.6624	.1649	1.0000	.2144	.3329	1.5575		.6559
2	.4300	1.6148	.1367	1.0000	.2302	.3502	1.5347		.6532
1	.3518	1.5843	.1187	1.0000	.2408	.3617	1.5189		.6512

8	.3518	1.5843	.1187	1.0000	.2408	.3617	1.5189	.6512
7	.3205	1.5943	.0955	1.0000	.2373	.3579	1.5290	.6509
6	.2943	1.5735	.0899	1.0000	.2447	.3658	1.5165	.6507
5	.2618	1.5653	.0786	1.0000	.2476	.3690	1.5126	.6500
4	.2261	1.5530	.0681	1.0000	.2522	.3738	1.5057	.6494
3	.1840	1.5397	.0540	1.0000	.2571	.3790	1.4983	.6487
2	.1296	1.5333	.0412	1.0000	.2595	.3815	1.4950	.6481
1	.0000	1.5312	.0000	1.0000	.2603	.3824	1.4949	.6479

XSHOCK =	.811171	YSHOCK =	.714890	P2 =	.186510	P1 =	.169102	MACH2 = 1.756	MACH1 = 1.819
XSHOCK =	.821300	YSHOCK =	.711035	P2 =	.184979	P1 =	.167932	MACH2 = 1.761	MACH1 = 1.823
XSHOCK =	.830410	YSHOCK =	.707580	P2 =	.183570	P1 =	.166874	MACH2 = 1.766	MACH1 = 1.827
XSHOCK =	.838550	YSHOCK =	.704502	P2 =	.182303	P1 =	.165925	MACH2 = 1.770	MACH1 = 1.831
XSHOCK =	.845788	YSHOCK =	.701775	P2 =	.181171	P1 =	.165085	MACH2 = 1.774	MACH1 = 1.834
XSHOCK =	.852195	YSHOCK =	.699366	P2 =	.180168	P1 =	.164346	MACH2 = 1.778	MACH1 = 1.837
XSHOCK =	.857848	YSHOCK =	.697246	P2 =	.179283	P1 =	.163704	MACH2 = 1.781	MACH1 = 1.840
XSHOCK =	.862818	YSHOCK =	.695385	P2 =	.178506	P1 =	.163154	MACH2 = 1.784	MACH1 = 1.842
XSHOCK =	.867178	YSHOCK =	.693755	P2 =	.177829	P1 =	.162706	MACH2 = 1.786	MACH1 = 1.844
XSHOCK =	.870993	YSHOCK =	.692330	P2 =	.177245	P1 =	.162458	MACH2 = 1.788	MACH1 = 1.845
XSHOCK =	.889197	YSHOCK =	.685515	P2 =	.177116	P1 =	.160274	MACH2 = 1.789	MACH1 = 1.854
XSHOCK =	.900000	YSHOCK =	.681482	P2 =	.175418	P1 =	.158989	MACH2 = 1.796	MACH1 = 1.859

X/R = .9000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1156	1.2857	.1242	.6793	.2499	.3326	1.3088		1.6941
16	1.0710	1.4080	.1216	.8367	.2456	.3486	1.4276		.7838
15	1.0424	1.5491	.1231	.9491	.2407	.3562	1.4954		.6944
14	1.0097	1.5860	.1255	.9855	.2367	.3558	1.5187		.6757
13	.9796	1.6022	.1275	.9965	.2337	.3537	1.5286		.6714
12	.9457	1.6276	.1380	.9993	.2257	.3452	1.5424		.6691
11	.9116	1.6516	.1481	.9999	.2178	.3367	1.5549		.6670
10	.8743	1.6525	.1462	.9999	.2176	.3364	1.5559		.6650
9	.8368	1.6662	.1506	.9999	.2131	.3315	1.5633		.6630
8	.7955	1.7237	.1781	.9999	.1955	.3116	1.5902		.6611
7	.7500	1.7799	.2049	.9999	.1794	.2932	1.6142		.6588
6	.6994	1.7968	.2111	.9999	.1749	.2878	1.6215		.6561
	.6815	1.7960	.2086	.9999	.1754	.2886	1.6219	-.3712	.6551
	.6815	1.8590	.2426	1.0000	.1590	.2689	1.6437	-.3712	.6499
5	.6438	1.8344	.2283	1.0000	.1651	.2762	1.6360		.6087
4	.5827	1.7966	.2060	1.0000	.1750	.2879	1.6230		.6462
3	.5178	1.7596	.1842	1.0000	.1851	.2997	1.6091		.6439
2	.4426	1.7064	.1531	1.0000	.2006	.3175	1.5866		.6411
1	.3648	1.6831	.1333	1.0000	.2078	.3256	1.5772		.6390
8	.3648	1.6831	.1333	1.0000	.2078	.3256	1.5772		.6390
7	.3304	1.7119	.1088	1.0000	.1990	.3156	1.5989		.6388
6	.3043	1.6718	.1074	1.0000	.2114	.3295	1.5752		.6387
5	.2701	1.6673	.0885	1.0000	.2128	.3311	1.5754		.6378
4	.2335	1.6509	.0786	1.0000	.2181	.3370	1.5667		.6372
3	.1858	1.6385	.0614	1.0000	.2222	.3415	1.5609		.6365
2	.1339	1.6295	.0453	1.0000	.2252	.3448	1.5566		.6359
1	.0000	1.6265	.0000	1.0000	.2262	.3459	1.5563		.6357

XSHOCK =	.919274	YSHOCK =	.674333	P2 =	.172398	P1 =	.156677	MACH2 =	1.806	MACH1 =	1.868
XSHOCK =	.938533	YSHOCK =	.667217	P2 =	.169878	P1 =	.154389	MACH2 =	1.816	MACH1 =	1.878
XSHOCK =	.957774	YSHOCK =	.660150	P2 =	.167425	P1 =	.152181	MACH2 =	1.825	MACH1 =	1.887
XSHOCK =	.977000	YSHOCK =	.653127	P2 =	.164999	P1 =	.150206	MACH2 =	1.835	MACH1 =	1.896
XSHOCK =	.996215	YSHOCK =	.646121	P2 =	.163898	P1 =	.147978	MACH2 =	1.839	MACH1 =	1.905
XSHOCK =	1.000000	YSHOCK =	.644742	P2 =	.163278	P1 =	.147543	MACH2 =	1.642	MACH1 =	1.907

X/R = 1.0000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1273	1.2638	.1105	.6594	.2499	.3298	1.2939		1.6699
16	1.0824	1.4263	.1060	.8125	.2460	.3461	1.4149		.8250
15	1.0538	1.5342	.1046	.9344	.2422	.3562	1.4887		.6943
14	1.0214	1.5816	.1065	.9803	.2370	.3556	1.5189		.6654
13	.9916	1.6054	.1123	.9950	.2322	.3519	1.5334		.6595
12	.9582	1.6168	.1138	.9990	.2293	.3491	1.5403		.6572
11	.9252	1.6397	.1220	.9998	.2217	.3410	1.5530		.6552
10	.8885	1.6696	.1342	.9999	.2121	.3303	1.5689		.6532
9	.8509	1.6753	.1330	.9999	.2103	.3283	1.5725		.6514
8	.8111	1.6855	.1339	.9999	.2070	.3247	1.5785		.6502
7	.7685	1.7475	.1617	.9999	.1885	.3037	1.6082		.6481
6	.7198	1.8182	.1943	.9999	.1693	.2812	1.6385		.6453
5	.6658	1.8416	.2020	.9999	.1633	.2740	1.6487		.6434
	.6447	1.8418	.2001	.9999	.1633	.2741	1.6494	-.3638	.6416
	.6447	1.9074	.2344	1.0000	.1475	.2549	1.6717	-.3638	.6359
4	.6040	1.8815	.2187	1.0000	.1536	.2623	1.6641		.6356
3	.5370	1.8521	.1991	1.0000	.1607	.2709	1.6552		.6334
2	.4606	1.8038	.1668	1.0000	.1730	.2856	1.6386		.6305
1	.3783	1.7747	.1497	1.0000	.1809	.2949	1.6266		.6284

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
[illegible]	.3783	1.7747	.1497	1.0000	.1809	.2949	1.6266		.6284
[illegible]	.3315	1.7897	.1194	1.0000	.1768	.2901	1.6416		.6283
[illegible]	.3157	1.7737	.1143	1.0000	.1812	.2951	1.6336		.6281
[illegible]	.2795	1.7689	.1009	1.0000	.1825	.2967	1.6332		.6272
[illegible]	.2418	1.7514	.0882	1.0000	.1874	.3024	1.6251		.6266
[illegible]	.1963	1.7375	.0691	1.0000	.1914	.3070	1.6195		.6258
[illegible]	.1387	1.7256	.0519	1.0000	.1949	.3110	1.6142		.6252
[illegible]	.0000	1.7216	.0000	1.0000	.1961	.3123	1.6141		.6250

[illegible]	[illegible]	YSHOCK =	.637767	P2 =	.160849	P1 =	.145325	MACH2 =	1.851	MACH1 =	1.917
[illegible]	[illegible]	YSHOCK =	.630836	P2 =	.158426	P1 =	.143121	MACH2 =	1.861	MACH1 =	1.927
[illegible]	[illegible]	YSHOCK =	.623944	P2 =	.156007	P1 =	.140936	MACH2 =	1.871	MACH1 =	1.937
[illegible]	[illegible]	YSHOCK =	.617083	P2 =	.153613	P1 =	.138869	MACH2 =	1.881	MACH1 =	1.947
[illegible]	[illegible]	YSHOCK =	.610203	P2 =	.153528	P1 =	.136586	MACH2 =	1.862	MACH1 =	1.957
[illegible]	[illegible]	YSHOCK =	.608753	P2 =	.152780	P1 =	.136111	MACH2 =	1.885	MACH1 =	1.959

AD-A038 614 GENERAL ELECTRIC CO CINCINNATI OHIO AIRCRAFT ENGINE GROUP F/G 20/1
SUPERSONIC JET EXHAUST NOISE INVESTIGATION. VOLUME III. COMPUTE--ETC(U)
JUL 76 D R FERGUSON, M A SMITH, P R KNOTT F33615-73-C-2031
UNCLASSIFIED R74AEG452-VOL-3 AFAPL-TR-76-68-VOL-3 NL

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X/R = 1.1000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1374	1.2478	.0935	.6455	.2499	.3278	1.2836		1.6500
16	1.0923	1.4085	.0914	.7927	.2461	.3438	1.4043		.8578
15	1.0636	1.5201	.0899	.9161	.2424	.3544	1.4815		.6993
14	1.0313	1.5709	.0897	.9713	.2386	.3563	1.5148		.6574
13	1.0019	1.5998	.0927	.9916	.2334	.3528	1.5329		.6489
12	.9688	1.6212	.0974	.9980	.2275	.3471	1.5457		.6463
11	.9362	1.6323	.0982	.9996	.2242	.3436	1.5525		.6445
10	.9005	1.6550	.1054	.9999	.2167	.3355	1.5654		.6427
9	.8636	1.6897	.1184	.9999	.2057	.3232	1.5840		.6408
8	.8236	1.6980	.1174	.9999	.2032	.3203	1.5892		.6397
7	.7823	1.7066	.1159	.9999	.2006	.3174	1.5945		.6384
6	.7371	1.7792	.1477	.9999	.1796	.2934	1.6297		.6360
5	.6853	1.8632	.1849	.9999	.1579	.2676	1.6654		.6337
4	.6251	1.8839	.1890	.9999	.1530	.2616	1.6751		.6316
	.6088	1.8351	.1867	.9999	.1528	.2614	1.6763	-.3587	.6306
	.6088	1.9595	.2250	1.0000	.1361	.2406	1.7012	-.3587	.6242
3	.5574	1.9373	.2088	1.0000	.1409	.2466	1.6959		.6238
2	.4779	1.8944	.1781	1.0000	.1505	.2586	1.6837		.6210
1	.3933	1.8685	.1603	1.0000	.1567	.2661	1.6751		.6189
8	.3933	1.8685	.1603	1.0000	.1567	.2661	1.6751		.6189
7	.3535	1.8912	.1272	1.0000	.1513	.2595	1.6949		.6188
6	.3275	1.8631	.1210	1.0000	.1580	.2677	1.6813		.6186
5	.2899	1.8593	.1072	1.0000	.1589	.2688	1.6820		.6178
4	.2511	1.8487	.0956	1.0000	.1615	.2719	1.6782		.6171
3	.2036	1.8351	.0767	1.0000	.1649	.2760	1.6736		.6163
2	.1442	1.8225	.0581	1.0000	.1682	.2799	1.6687		.6157
1	.0000	1.8183	.0000	1.0000	.1692	.2811	1.6692		.6154

XSHOCK =	1.119211	YSHOCK =	.601848	P2 =	.150289	P1 =	.133859	MACH2 = 1.894	MACH1 = 1.970
XSHOCK =	1.138440	YSHOCK =	.594966	P2 =	.147807	P1 =	.131619	MACH2 = 1.906	MACH1 = 1.981
XSHOCK =	1.157687	YSHOCK =	.588139	P2 =	.145397	P1 =	.129397	MACH2 = 1.917	MACH1 = 1.992
XSHOCK =	1.176953	YSHOCK =	.581323	P2 =	.143013	P1 =	.127202	MACH2 = 1.928	MACH1 = 2.003
XSHOCK =	1.196239	YSHOCK =	.574551	P2 =	.140690	P1 =	.125068	MACH2 = 1.939	MACH1 = 2.014
XSHOCK =	1.200000	YSHOCK =	.573231	P2 =	.140824	P1 =	.124643	MACH2 = 1.937	MACH1 = 2.016

X/R = 1.2000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U- VELOCITY	SHOCK ANGLE	[illegible]
17	1.1061	1.2313	.0793	.6315	.2499	.3257	1.2722		1.[illegible]299
16	1.1006	1.3909	.0756	.7730	.2460	.3412	1.3935		.8838
15	1.0717	1.5067	.0730	.8978	.2422	.3522	1.4745		.7084
14	1.0395	1.5670	.0732	.9623	.2377	.3544	1.5143		.6517
13	1.0102	1.5963	.0738	.9881	.2337	.3529	1.5331		.6396
12	.9775	1.6177	.0768	.9970	.2285	.3481	1.5463		.6363
11	.9452	1.6376	.0812	.9994	.2224	.3416	1.5581		.6345
10	.9098	1.6485	.0814	.9999	.2189	.3378	1.5648		.6330
9	.8739	1.6726	.0881	.9999	.2111	.3292	1.5787		.6313
8	.8346	1.7120	.1025	.9999	.1989	.3155	1.6000		.6300
7	.7930	1.7187	.0991	.9999	.1969	.3133	1.6045		.6289
6	.7493	1.7292	.0969	.9999	.1938	.3097	1.6110		.6276
5	.7016	1.8247	.1380	.9999	.1676	.2791	1.6570		.6254
4	.6433	1.9119	.1736	.9999	.1465	.2536	1.6940		.6229
3	.5782	1.9351	.1746	.9999	.1413	.2472	1.7055		.6216
	.5732	1.9374	.1747	.9998	.1408	.2465	1.7067	-.3529	.6194
	.5732	2.0161	.2141	1.0000	.1246	.2260	1.7324	-.3529	.6127
2	.4962	1.9790	.1860	1.0000	.1320	.2355	1.7239		.6124
1	.4092	1.9562	.1689	1.0000	.1368	.2415	1.7178		.6102
8	.4092	1.9562	.1689	1.0000	.1368	.2415	1.7178		.6102
7	.3663	1.9870	.1351	1.0000	.1304	.2334	1.7416		.6103
6	.3403	1.9544	.1301	1.0000	.1372	.2420	1.7266		.6101
5	.3008	1.9503	.1119	1.0000	.1381	.2431	1.7283		.6092
4	.2609	1.9381	.1000	1.0000	.1407	.2464	1.7242		.6086
3	.2115	1.9279	.0820	1.0000	.1429	.2492	1.7219		.6078
2	.1503	1.9189	.0631	1.0000	.1449	.2517	1.7196		.6071
1	.0000	1.9159	.0000	1.0000	.1456	.2525	1.7215		.6069

XSHOCK =	1.219310	YSHOCK =	.566424	P2 =	.138684	P1 =	.122483	MACH2 =	1.947	MACH1 =	2.027
XSHOCK =	1.238641	YSHOCK =	.559610	P2 =	.136323	P1 =	.120363	MACH2 =	1.957	MACH1 =	2.039
XSHOCK =	1.257995	YSHOCK =	.552814	P2 =	.133999	P1 =	.118277	MACH2 =	1.970	MACH1 =	2.050
XSHOCK =	1.277371	YSHOCK =	.546055	P2 =	.131746	P1 =	.116216	MACH2 =	1.980	MACH1 =	2.061
XSHOCK =	1.296769	YSHOCK =	.539309	P2 =	.129520	P1 =	.114185	MACH2 =	1.991	MACH1 =	2.072
XSHOCK =	1.300000	YSHOCK =	.538188	P2 =	.128995	P1 =	.113855	MACH2 =	1.994	MACH1 =	2.074

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1532	1.2143	.0637	.6176	.2499	.3237	1.2601		1.6096
16	1.1074	1.3726	.0592	.7533	.2460	.3387	1.3817		.9045
15	1.0782	1.4926	.0559	.8795	.2422	.3501	1.4666		.7206
14	1.0459	1.5607	.0555	.9532	.2376	.3534	1.5120		.6486
13	1.0167	1.5962	.0567	.9846	.2329	.3516	1.5347		.6314
12	.9842	1.6163	.0577	.9960	.2287	.3482	1.5474		.6272
11	.9523	1.6348	.0606	.9991	.2232	.3425	1.5587		.6253
10	.9171	1.6546	.0647	.9998	.2169	.3356	1.5704		.6237
9	.8815	1.6644	.0633	.9999	.2137	.3321	1.5766		.6225
8	.8433	1.6929	.0711	.9999	.2047	.3221	1.5930		.6214
7	.8023	1.7373	.0862	.9999	.1915	.3071	1.6172		.6199
6	.7579	1.7347	.0759	.9999	.1922	.3079	1.6171		.6189
5	.7125	1.7630	.0803	.9999	.1841	.2986	1.6328		.6182
4	.6587	1.8411	.1298	.9999	.1536	.2624	1.6891		.6155
3	.5952	1.9747	.1642	.9999	.1329	.2366	1.7282		.6136
	.5382	1.9941	.1631	.9998	.1290	.2316	1.7380	-.3466	.6115
	.5382	2.0742	.2026	1.0000	.1139	.2118	1.7635	-.3466	.6047
2	.5150	2.0543	.1897	1.0000	.1174	.2166	1.7586		.6045
1	.4258	2.0355	.1732	1.0000	.1209	.2212	1.7549		.6024
8	.4258	2.0355	.1732	1.0000	.1209	.2212	1.7549		.6024
7	.3797	2.0764	.1900	1.0000	.1135	.2113	1.7830		.6025
6	.3538	2.0436	.1370	1.0000	.1194	.2192	1.7684		.6023
5	.3122	2.0426	.1174	1.0000	.1196	.2194	1.7722		.6014
4	.2711	2.0251	.1043	1.0000	.1229	.2237	1.7665		.6008
3	.2199	2.0163	.0847	1.0000	.1246	.2259	1.7655		.6000
2	.1567	2.0122	.0660	1.0000	.1254	.2270	1.7659		.5993
1	.0000	2.0108	.0000	1.0000	.1257	.2273	1.7691		.5991

XSHOCK =	1.319424	YSHOCK =	.531485	P2 =	.126860	P1 =	.111889	MACH2 =	2.006	MACH1 =	2.085
XSHOCK =	1.338871	YSHOCK =	.524781	P2 =	.125023	P1 =	.110091	MACH2 =	2.014	MACH1 =	2.096
XSHOCK =	1.358325	YSHOCK =	.518037	P2 =	.123294	P1 =	.108720	MACH2 =	2.023	MACH1 =	2.104
XSHOCK =	1.377655	YSHOCK =	.511303	P2 =	.122185	P1 =	.106668	MACH2 =	2.029	MACH1 =	2.116
XSHOCK =	1.396860	YSHOCK =	.504604	P2 =	.119995	P1 =	.104627	MACH2 =	2.041	MACH1 =	2.128
XSHOCK =	1.400000	YSHOCK =	.503510	P2 =	.119501	P1 =	.104298	MACH2 =	2.043	MACH1 =	2.130

X/R = 1.4000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1588	1.1969	.0483	.6036	.2499	.3215	1.2471		1.5889
16	1.1125	1.3528	.0425	.7335	.2462	.3363	1.3683		.9209
15	1.0829	1.4770	.0387	.8612	.2424	.3482	1.4574		.7352
14	1.0506	1.5531	.0376	.9442	.2380	.3529	1.5083		.6482
13	1.0215	1.5925	.0384	.9811	.2334	.3518	1.5337		.6245
12	.9891	1.6168	.0402	.9950	.2283	.3477	1.5490		.6189
11	.9573	1.6326	.0409	.9989	.2239	.3433	1.5588		.6168
10	.9226	1.6521	.0442	.9998	.2176	.3365	1.5707		.6153
9	.8870	1.6723	.0479	.9999	.2112	.3293	1.5828		.6140
8	.8490	1.6801	.0435	.9999	.2087	.3266	1.5878		.6133
7	.8094	1.7202	.0553	.9999	.1965	.3128	1.6108		.6121
6	.7651	1.7613	.0664	.9999	.1846	.2991	1.6335		.6107
5	.7189	1.7505	.0493	.9999	.1877	.3027	1.6289		.6106
4	.6686	1.8084	.0668	.9999	.1718	.2842	1.6601		.6096
3	.6099	1.9617	.1298	.9999	.1356	.2400	1.7303		.6068
2	.5315	2.0244	.1448	.9998	.1230	.2239	1.7573		.6042
	.5035	2.0432	.1461	.9997	.1195	.2193	1.7659	-.3479	.6027
	.5035	2.1303	.1882	1.0000	.1043	.1990	1.7935	-.3479	.5955
1	.4027	2.1180	.1791	1.0000	.1063	.2017	1.7909		.5953

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	TURBULENCE INTEN.
8	.4027	2.1180	.1791	1.0000	.1063	.2017	1.7909	.5953
7	.3935	2.1588	.1415	1.0000	.0997	.1927	1.8195	.5955
6	.3679	2.1253	.1408	1.0000	.1051	.2001	1.8049	.5951
5	.3201	2.1313	.1219	1.0000	.1041	.1987	1.8120	.5943
4	.2818	2.1123	.1089	1.0000	.1073	.2030	1.8062	.5936
3	.2284	2.1029	.0863	1.0000	.1089	.2051	1.8059	.5929
2	.1634	2.1010	.0675	1.0000	.1092	.2056	1.8076	.5922
1	.0000	2.1004	.0000	1.0000	.1093	.2057	1.8114	.5920

XSHOCK =	1.419059	YSHOCK =	.496889	P2 =	.117914	P1 =	.102781	MACH2 = 2.052	MACH1 = 2.140
XSHOCK =	1.437967	YSHOCK =	.490340	P2 =	.116022	P1 =	.101008	MACH2 = 2.062	MACH1 = 2.151
XSHOCK =	1.456692	YSHOCK =	.483869	P2 =	.113975	P1 =	.099091	MACH2 = 2.074	MACH1 = 2.163
XSHOCK =	1.475250	YSHOCK =	.477463	P2 =	.111874	P1 =	.097125	MACH2 = 2.085	MACH1 = 2.176
XSHOCK =	1.493654	YSHOCK =	.471114	P2 =	.109798	P1 =	.095196	MACH2 = 2.097	MACH1 = 2.189
XSHOCK =	1.511915	YSHOCK =	.464820	P2 =	.108246	P1 =	.093791	MACH2 = 2.106	MACH1 = 2.198
XSHOCK =	1.530038	YSHOCK =	.458584	P2 =	.107892	P1 =	.094896	MACH2 = 2.109	MACH1 = 2.191
XSHOCK =	1.548028	YSHOCK =	.452286	P2 =	.101765	P1 =	.090182	MACH2 = 2.146	MACH1 = 2.223
XSHOCK =	1.565884	YSHOCK =	.445811	P2 =	.104886	P1 =	.086527	MACH2 = 2.127	MACH1 = 2.250
XSHOCK =	1.563608	YSHOCK =	.439069	P2 =	.104784	P1 =	.083517	MACH2 = 2.128	MACH1 = 2.272
XSHOCK =	1.600000	YSHOCK =	.432720	P2 =	.104450	P1 =	.081510	MACH2 = 2.129	MACH1 = 2.288

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1648	1.1756	.0157	.5872	.2499	.3190	1.2310		1.5611
16	1.1178	1.3247	.0111	.7074	.2468	.3335	1.3485		.9459
15	1.0876	1.4463	.0066	.8284	.2438	.3458	1.4369		.7688
14	1.0548	1.5287	.0039	.9176	.2397	.3518	1.4932		.6551
13	1.0256	1.5774	.0029	.9660	.2350	.3519	1.5251		.6141
12	.9933	1.6061	.0023	.9885	.2305	.3494	1.5435		.6034
11	.9617	1.6269	.0027	.9968	.2253	.3446	1.5566		.6002
10	.9272	1.6442	.0029	.9992	.2201	.3391	1.5673		.5988
9	.8923	1.6615	.0031	.9998	.2146	.3331	1.5780		.5978
8	.8545	1.6918	.0094	.9999	.2051	.3225	1.5963		.5969
7	.8147	1.7037	.0050	.9999	.2014	.3184	1.6034		.5964
6	.7727	1.7232	.0036	.9999	.1956	.3118	1.6150		.5959
5	.7270	1.7952	.0277	.9999	.1753	.2883	1.6557		.5946
4	.6740	1.7789	.0041	.9999	.1797	.2935	1.6471		.5953
3	.6238	1.8091	.0029	.9999	.1716	.2839	1.6641		.5968
2	.5549	2.0031	.0794	.9998	.1272	.2292	1.7598		.5918
1	.4715	2.0707	.0634	.9998	.1145	.2126	1.7940		.5896
8	.4715	2.0706	.0634	.9998	.1145	.2126	1.7940		.5896
	.4327	2.1286	.0632	.9985	.1044	.1991	1.8206	-.3922	.5974
	.4327	2.2878	.1355	1.0000	.0815	.1646	1.8750	-.3922	.5839
7	.4210	2.2893	.1340	1.0000	.0813	.1666	1.8759		.5833
6	.3969	2.2702	.1424	1.0000	.0838	.1702	1.8661		.5813
5	.3486	2.2917	.1234	1.0000	.0810	.1661	1.8794		.5806
4	.3043	2.2773	.1145	1.0000	.0829	.1688	1.8756		.5799
3	.2460	2.2717	.0889	1.0000	.0836	.1699	1.8782		.5792
2	.1771	2.2671	.0695	1.0000	.0842	.1707	1.8792		.5786
1	.0000	2.2656	.0000	1.0000	.0844	.1710	1.8831		.5784

XSHOCK =	1.617464	YSHOCK =	.425841	P2 =	.105930	P1 =	.081114	MACH2 =	2.119	MACH1 =	2.291
XSHOCK =	1.634793	YSHOCK =	.418978	P2 =	.107543	P1 =	.081262	MACH2 =	2.112	MACH1 =	2.291
XSHOCK =	1.651985	YSHOCK =	.412141	P2 =	.107510	P1 =	.080600	MACH2 =	2.110	MACH1 =	2.296
XSHOCK =	1.669041	YSHOCK =	.405317	P2 =	.105738	P1 =	.078672	MACH2 =	2.120	MACH1 =	2.310
XSHOCK =	1.685961	YSHOCK =	.398495	P2 =	.103954	P1 =	.076662	MACH2 =	2.131	MACH1 =	2.327
XSHOCK =	1.702745	YSHOCK =	.391685	P2 =	.101925	P1 =	.074848	MACH2 =	2.143	MACH1 =	2.342
XSHOCK =	1.719394	YSHOCK =	.384898	P2 =	.100293	P1 =	.073216	MACH2 =	2.153	MACH1 =	2.356
XSHOCK =	1.735908	YSHOCK =	.378125	P2 =	.099186	P1 =	.071759	MACH2 =	2.160	MACH1 =	2.369
XSHOCK =	1.752288	YSHOCK =	.371365	P2 =	.098519	P1 =	.070588	MACH2 =	2.164	MACH1 =	2.380
XSHOCK =	1.768534	YSHOCK =	.364624	P2 =	.098184	P1 =	.069629	MACH2 =	2.166	MACH1 =	2.389
XSHOCK =	1.784648	YSHOCK =	.357906	P2 =	.097845	P1 =	.068779	MACH2 =	2.168	MACH1 =	2.396
XSHOCK =	1.800629	YSHOCK =	.351226	P2 =	.096920	P1 =	.067841	MACH2 =	2.174	MACH1 =	2.405
XSHOCK =	1.816479	YSHOCK =	.344587	P2 =	.096055	P1 =	.066815	MACH2 =	2.180	MACH1 =	2.415
XSHOCK =	1.832198	YSHOCK =	.337973	P2 =	.095382	P1 =	.065699	MACH2 =	2.184	MACH1 =	2.426
XSHOCK =	1.847786	YSHOCK =	.331371	P2 =	.094569	P1 =	.064415	MACH2 =	2.189	MACH1 =	2.438
XSHOCK =	1.863245	YSHOCK =	.324776	P2 =	.093568	P1 =	.063196	MACH2 =	2.196	MACH1 =	2.451
XSHOCK =	1.878574	YSHOCK =	.318191	P2 =	.092300	P1 =	.062037	MACH2 =	2.202	MACH1 =	2.463
XSHOCK =	1.893775	YSHOCK =	.311633	P2 =	.091099	P1 =	.060935	MACH2 =	2.213	MACH1 =	2.474
XSHOCK =	1.908847	YSHOCK =	.305100	P2 =	.090375	P1 =	.059888	MACH2 =	2.217	MACH1 =	2.485

XSHOCK =	1.923792	YSHOCK =	.298572	P2 =	.089791	P1 =	.058895	MACH2 =	2.221	MACH1 =	2.496
XSHOCK =	1.938610	YSHOCK =	.292088	P2 =	.089359	P1 =	.057959	MACH2 =	2.224	MACH1 =	2.506
XSHOCK =	1.953302	YSHOCK =	.285523	P2 =	.089093	P1 =	.057089	MACH2 =	2.225	MACH1 =	2.516
XSHOCK =	1.967867	YSHOCK =	.278994	P2 =	.089972	P1 =	.056364	MACH2 =	2.225	MACH1 =	2.524
XSHOCK =	1.982308	YSHOCK =	.272448	P2 =	.089214	P1 =	.056043	MACH2 =	2.224	MACH1 =	2.528
XSHOCK =	1.996624	YSHOCK =	.265884	P2 =	.089537	P1 =	.055334	MACH2 =	2.221	MACH1 =	2.536
XSHOCK =	2.000000	YSHOCK =	.264328	P2 =	.089290	P1 =	.055165	MACH2 =	2.222	MACH1 =	2.538

X/R = 2.0000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1590	1.1304	-.0387	.5543	.2499	.3138	1.1927		1.5039
16	1.1105	1.2665	-.0467	.6551	.2474	.3268	1.3025		.9675
15	1.0780	1.3851	-.0538	.7627	.2447	.3386	1.3912		.8252
14	1.0435	1.4825	-.0594	.8643	.2415	.3476	1.4594		.6893
13	1.0132	1.5479	-.0630	.9358	.2378	.3517	1.5029		.6126
12	.9803	1.5869	-.0661	.9756	.2340	.3519	1.5279		.5846
11	.9483	1.6123	-.0675	.9925	.2293	.3485	1.5439		.5763
10	.9134	1.6294	-.0698	.9980	.2248	.3441	1.5543		.5739
9	.8783	1.6444	-.0726	.9995	.2201	.3392	1.5633		.5728
8	.8402	1.6684	-.0717	.9999	.2124	.3307	1.5782		.5723
7	.8006	1.6702	-.0840	.9999	.2119	.3301	1.5777		.5725
6	.7583	1.7236	-.0710	.9999	.1955	.3116	1.6112		.5717
5	.7110	1.7127	-.0954	.9999	.1987	.3153	1.6015		.5732
4	.6645	1.7772	-.0817	.9999	.1802	.2940	1.6407		.5726
3	.6020	1.8134	-.0929	.9999	.1705	.2826	1.6593		.5746
2	.5472	1.8643	-.0962	.9998	.1577	.2673	1.6865		.5745
1	.4588	1.9341	-.1150	.9998	.1415	.2474	1.7195		.5704
8	.4588	1.9341	-.1150	.9998	.1415	.2474	1.7195		.5704
7	.4139	1.9273	-.1011	.9979	.1428	.2488	1.7186		.5800
6	.3976	1.9458	-.1160	.9974	.1387	.2437	1.7252		.5883
5	.3605	1.9765	-.1125	.9959	.1320	.2351	1.7413		.5918
4	.3282	2.1246	-.0659	.9943	.1046	.1991	1.8185		.5952
3	.2768	2.2111	-.0518	.9899	.0910	.1799	1.8578		.5893
	.2643	2.2223	-.0541	.9887	.0893	.1775	1.8623	-.4610	.5862
	.2643	2.5381	.0773	1.0000	.0552	.1262	1.9793	-.4610	.5589
2	.2054	2.5539	.0703	1.0000	.0538	.1240	1.9857		.5588
1	.0000	2.5429	.0000	1.0000	.0548	.1256	1.9868		.5577

XSHOCK =	YSHOCK =	P2 =	P1 =	MACH2 =	MACH1 =
2.014163	.257782	.088901	.054455	2.225	2.546
2.028202	.251251	.088833	.053747	2.225	2.555
2.042125	.244724	.088833	.053041	2.224	2.563
2.055938	.238192	.088929	.052339	2.223	2.572
2.069646	.231651	.089141	.051641	2.220	2.581
2.083255	.225092	.089479	.050948	2.217	2.589
2.096770	.218510	.089964	.050258	2.212	2.598
2.110197	.211900	.090606	.049535	2.206	2.608
2.123539	.205279	.090137	.049015	2.209	2.614
2.136803	.198663	.089952	.048522	2.210	2.621
2.149992	.192037	.090057	.048054	2.208	2.627
2.163111	.185391	.090372	.047610	2.205	2.633
2.176161	.178714	.090864	.047190	2.200	2.639
2.189147	.171998	.091554	.046791	2.194	2.644
2.202070	.165233	.092441	.046414	2.187	2.650
2.214931	.158414	.093414	.046057	2.178	2.655

```
XSHOCK =    2.227731   YSHOCK =     .151535   P2 =    .094586   P1 =    .045719   MACH2 =   2.168   MACH1 =   2.659
XSHOCK =    2.240470   YSHOCK =     .144588   P2 =    .095854   P1 =    .045401   MACH2 =   2.157   MACH1 =   2.664
XSHOCK =    2.253149   YSHOCK =     .137570   P2 =    .097264   P1 =    .045101   MACH2 =   2.146   MACH1 =   2.668
XSHOCK =    2.265768   YSHOCK =     .130475   P2 =    .098815   P1 =    .044818   MACH2 =   2.133   MACH1 =   2.672
XSHOCK =    2.278327   YSHOCK =     .123296   P2 =    .100506   P1 =    .044553   MACH2 =   2.119   MACH1 =   2.676
XSHOCK =    2.290824   YSHOCK =     .116027   P2 =    .102413   P1 =    .044306   MACH2 =   2.105   MACH1 =   2.680
DATA IS BEING STORED FOR POSSIBLE RESTART AT X=     2.2908237
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X/R = 2.2908

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1422	1.1144	-.0759	.5433	.2499	.3120	1.1768		1.4939
16	1.0911	1.2342	-.0828	.6375	.2480	.3248	1.2820		.9742
15	1.0572	1.3584	-.0887	.7382	.2459	.3366	1.3683		.8555
14	1.0212	1.4516	-.0953	.8346	.2437	.3465	1.4341		.7195
13	.9895	1.5147	-.1021	.9057	.2415	.3523	1.4762		.6228
12	.9554	1.5585	-.1070	.9499	.2376	.3530	1.5042		.5783
11	.9221	1.5882	-.1114	.9742	.2332	.3509	1.5226		.5636
10	.8863	1.6130	-.1147	.9873	.2278	.3464	1.5378		.5590
9	.8494	1.6277	-.1218	.9944	.2245	.3435	1.5457		.5579
8	.8111	1.6433	-.1282	.9979	.2201	.3390	1.5541		.5573
7	.7690	1.6613	-.1346	.9993	.2146	.3330	1.5638		.5575
6	.7268	1.6784	-.1423	.9997	.2092	.3271	1.5724		.5574
5	.6766	1.7076	-.1466	.9999	.2003	.3170	1.5888		.5582
4	.6287	1.7311	-.1549	.9999	.1933	.3091	1.6006		.5587
3	.5639	1.7608	-.1660	.9999	.1847	.2993	1.6147		.5605
2	.5074	1.7890	-.1795	.9998	.1770	.2902	1.6269		.5609
1	.4159	1.8634	-.1851	.9998	.1579	.2675	1.6655		.5586
8	.4159	1.8634	-.1851	.9998	.1579	.2675	1.6655		.5586
7	.3748	1.8243	-.1680	.9979	.1673	.2787	1.6494		.5652
6	.3545	1.8456	-.1937	.9974	.1619	.2721	1.6534		.5744
5	.3171	1.8808	-.1701	.9959	.1531	.2614	1.6790		.5796
4	.2815	1.9022	-.1804	.9943	.1479	.2549	1.6871		.5895
3	.2366	1.8268	-.2284	.9899	.1653	.2757	1.6319		.5957
2	.1871	1.9174	-.2003	.9780	.1421	.2466	1.6887		.6121
	.1160	2.1046	-.1853	.9427	.1024	.1931	1.7830	-.5869	.6147
	.1160	2.6798	.0443	1.0000	.0443	.1079	2.0295	-.5869	.5648
1	.0000	2.5880	.0000	1.0000	.0511	.1194	2.0020		.5679

XSHOCK =	2.303258	YSHOCK =	.108660	P2 =	.104467	P1 =	.044075	MACH2 =	2.088	MACH1 =	2.683
XSHOCK =	2.315629	YSHOCK =	.101188	P2 =	.106687	P1 =	.043860	MACH2 =	2.071	MACH1 =	2.686
XSHOCK =	2.327936	YSHOCK =	.093602	P2 =	.109116	P1 =	.043663	MACH2 =	2.053	MACH1 =	2.689
XSHOCK =	2.340179	YSHOCK =	.085895	P2 =	.111612	P1 =	.043480	MACH2 =	2.034	MACH1 =	2.692
XSHOCK =	2.352358	YSHOCK =	.078065	P2 =	.114169	P1 =	.043324	MACH2 =	2.015	MACH1 =	2.694
XSHOCK =	2.364473	YSHOCK =	.070108	P2 =	.116839	P1 =	.043224	MACH2 =	1.995	MACH1 =	2.696
XSHOCK =	2.376524	YSHOCK =	.061974	P2 =	.121350	P1 =	.043179	MACH2 =	1.963	MACH1 =	2.697
XSHOCK =	2.388512	YSHOCK =	.053615	P2 =	.125966	P1 =	.043197	MACH2 =	1.931	MACH1 =	2.696
XSHOCK =	2.400000	YSHOCK =	.045343	P2 =	.130573	P1 =	.043275	MACH2 =	1.900	MACH1 =	2.695

X/R = 2.4000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
17	1.1334	1.1083	-.0863	.5392	.2499	.3113	1.1706		1.4901
16	1.0815	1.2366	-.0939	.6309	.2480	.3238	1.2748		.9761
15	1.0468	1.3495	-.1005	.7291	.2458	.3354	1.3602		.8642
14	1.0102	1.4433	-.1070	.8235	.2434	.3448	1.4266		.7296
13	.9778	1.5087	-.1135	.8944	.2406	.3501	1.4703		.6275
12	.9429	1.5507	-.1205	.9403	.2379	.3523	1.4969		.5773
11	.9090	1.5769	-.1281	.9673	.2355	.3526	1.5124		.5597
10	.8727	1.5990	-.1342	.9833	.2317	.3502	1.5253		.5543
9	.8353	1.6216	-.1382	.9925	.2262	.3451	1.5386		.5527
8	.7962	1.6389	-.1441	.9971	.2214	.3403	1.5481		.5521
7	.7534	1.6560	-.1506	.9990	.2162	.3348	1.5570		.5522
6	.7102	1.6680	-.1603	.9997	.2125	.3308	1.5620		.5522
5	.6594	1.6867	-.1687	.9999	.2067	.3242	1.5711		.5531
4	.6106	1.7081	-.1765	.9999	.2001	.3169	1.5816		.5536
3	.5448	1.7418	-.1837	.9999	.1902	.3055	1.5991		.5552
2	.4863	1.7471	-.2070	.9998	.1886	.3038	1.5951		.5559
1	.3944	1.8161	-.2067	.9998	.1698	.2818	1.6335		.5545
8	.3944	1.8161	-.2067	.9998	.1698	.2818	1.6335		.5545
7	.3561	1.7634	-.1822	.9979	.1837	.2979	1.6118		.5602
6	.3327	1.8057	-.1974	.9974	.1721	.2843	1.6308		.5687
5	.2963	1.7532	-.2094	.9959	.1862	.3006	1.5978		.5751
4	.2616	1.8264	-.1875	.9943	.1662	.2771	1.6450		.5839
3	.2127	1.7794	-.2125	.9899	.1778	.2904	1.6115		.5912
2	.1629	1.7767	-.2336	.9780	.1764	.2877	1.6027		.6427
	.0453	1.9002	-.2882	.8752	.1306	.2249	1.6463	-.7315	.6565
	.0453	2.6951	.0282	1.0000	.0433	.1061	2.0354	-.7315	.5933
1	.0000	2.6293	.0000	1.0000	.0479	.1141	2.0154		.5961

XSHOCK =	2.411863	YSHOCK =	.036511	P2 =	.135700	P1 =	.043417	MACH2 =	1.867	MACH1 =	2.693
XSHOCK =	2.423663	YSHOCK =	.027398	P2 =	.141439	P1 =	.043628	MACH2 =	1.831	MACH1 =	2.690
XSHOCK =	2.435400	YSHOCK =	.017956	P2 =	.147910	P1 =	.043915	MACH2 =	1.791	MACH1 =	2.686
XSHOCK =	2.447074	YSHOCK =	.008101	P2 =	.453831	P1 =	.167875	MACH2 =	1.046	MACH1 =	1.786
XSHOCK =	2.458685	YSHOCK =	.017765	P2 =	.374736	P1 =	.179138	MACH2 =	1.200	MACH1 =	1.745
XSHOCK =	2.470233	YSHOCK =	.027735	P2 =	.390173	P1 =	.191011	MACH2 =	1.175	MACH1 =	1.705
XSHOCK =	2.481719	YSHOCK =	.037940	P2 =	.399355	P1 =	.203170	MACH2 =	1.164	MACH1 =	1.666
XSHOCK =	2.493144	YSHOCK =	.048294	P2 =	.407914	P1 =	.215399	MACH2 =	1.154	MACH1 =	1.629
XSHOCK =	2.504507	YSHOCK =	.058835	P2 =	.417019	P1 =	.227452	MACH2 =	1.142	MACH1 =	1.595
XSHOCK =	2.515809	YSHOCK =	.069635	P2 =	.427852	P1 =	.240263	MACH2 =	1.127	MACH1 =	1.560
XSHOCK =	2.527050	YSHOCK =	.080775	P2 =	.440669	P1 =	.253789	MACH2 =	1.108	MACH1 =	1.525
XSHOCK =	2.538231	YSHOCK =	.092316	P2 =	.452993	P1 =	.266119	MACH2 =	1.090	MACH1 =	1.495
XSHOCK =	2.549353	YSHOCK =	.104331	P2 =	.468049	P1 =	.278477	MACH2 =	1.067	MACH1 =	1.465
XSHOCK =	2.560411	YSHOCK =	.117105	P2 =	.493088	P1 =	.293052	MACH2 =	1.025	MACH1 =	1.432
XSHOCK =	2.571383	YSHOCK =	.130614	P2 =	.502117	P1 =	.301712	MACH2 =	1.014	MACH1 =	1.414
XSHOCK =	2.578476	YSHOCK =	.139370	P2 =	.487024	P1 =	.297452	MACH2 =	1.043	MACH1 =	1.426
XSHOCK =	2.587741	YSHOCK =	.150238	P2 =	.462995	P1 =	.291370	MACH2 =	1.089	MACH1 =	1.442
XSHOCK =	2.597813	YSHOCK =	.161534	P2 =	.450900	P1 =	.286223	MACH2 =	1.113	MACH1 =	1.457
XSHOCK =	2.607744	YSHOCK =	.172553	P2 =	.452742	P1 =	.284986	MACH2 =	1.111	MACH1 =	1.462
XSHOCK =	2.617689	YSHOCK =	.183598	P2 =	.451175	P1 =	.284875	MACH2 =	1.115	MACH1 =	1.463
XSHOCK =	2.627316	YSHOCK =	.194312	P2 =	.453491	P1 =	.284524	MACH2 =	1.112	MACH1 =	1.465
XSHOCK =	2.636594	YSHOCK =	.204721	P2 =	.457105	P1 =	.284309	MACH2 =	1.106	MACH1 =	1.466
XSHOCK =	2.645499	YSHOCK =	.214791	P2 =	.463095	P1 =	.284257	MACH2 =	1.095	MACH1 =	1.467
XSHOCK =	2.654010	YSHOCK =	.224419	P2 =	.460866	P1 =	.285918	MACH2 =	1.100	MACH1 =	1.463

XSHOCK =	2.662114	YSHOCK =	.233571	P2 =	.462084	P1 =	.287007	MACH2 =	1.098	MACH1 =	1.461
XSHOCK =	2.669800	YSHOCK =	.242296	P2 =	.462884	P1 =	.287189	MACH2 =	1.097	MACH1 =	1.460
XSHOCK =	2.677065	YSHOCK =	.250555	P2 =	.460700	P1 =	.286938	MACH2 =	1.102	MACH1 =	1.461
XSHOCK =	2.683907	YSHOCK =	.258283	P2 =	.457490	P1 =	.283864	MACH2 =	1.107	MACH1 =	1.469
XSHOCK =	2.690329	YSHOCK =	.265489	P2 =	.457425	P1 =	.280515	MACH2 =	1.107	MACH1 =	1.478
XSHOCK =	2.696339	YSHOCK =	.272203	P2 =	.458550	P1 =	.277565	MACH2 =	1.104	MACH1 =	1.485
XSHOCK =	2.701948	YSHOCK =	.278398	P2 =	.460799	P1 =	.271240	MACH2 =	1.099	MACH1 =	1.501
XSHOCK =	2.707166	YSHOCK =	.284105	P2 =	.458689	P1 =	.274317	MACH2 =	1.104	MACH1 =	1.494
XSHOCK =	2.712009	YSHOCK =	.289386	P2 =	.456577	P1 =	.277500	MACH2 =	1.109	MACH1 =	1.486
XSHOCK =	2.716493	YSHOCK =	.294291	P2 =	.457453	P1 =	.281107	MACH2 =	1.108	MACH1 =	1.477
XSHOCK =	2.720635	YSHOCK =	.298865	P2 =	.456887	P1 =	.285690	MACH2 =	1.110	MACH1 =	1.465
XSHOCK =	2.724454	YSHOCK =	.303079	P2 =	.454164	P1 =	.283467	MACH2 =	1.115	MACH1 =	1.471
XSHOCK =	2.727967	YSHOCK =	.306950	P2 =	.458080	P1 =	.281172	MACH2 =	1.107	MACH1 =	1.477
XSHOCK =	2.731194	YSHOCK =	.310530	P2 =	.461609	P1 =	.278636	MACH2 =	1.100	MACH1 =	1.484
XSHOCK =	2.734152	YSHOCK =	.313821	P2 =	.463311	P1 =	.275773	MACH2 =	1.097	MACH1 =	1.491
XSHOCK =	2.736861	YSHOCK =	.316827	P2 =	.464367	P1 =	.272532	MACH2 =	1.094	MACH1 =	1.499
XSHOCK =	2.739337	YSHOCK =	.319559	P2 =	.464881	P1 =	.268687	MACH2 =	1.092	MACH1 =	1.509
XSHOCK =	2.741598	YSHOCK =	.322033	P2 =	.465337	P1 =	.264345	MACH2 =	1.090	MACH1 =	1.520
XSHOCK =	2.747906	YSHOCK =	.328912	P2 =	.463940	P1 =	.260881	MACH2 =	1.092	MACH1 =	1.530
XSHOCK =	2.754281	YSHOCK =	.335776	P2 =	.469351	P1 =	.265151	MACH2 =	1.083	MACH1 =	1.518
XSHOCK =	2.760477	YSHOCK =	.342534	P2 =	.477511	P1 =	.269026	MACH2 =	1.069	MACH1 =	1.508
XSHOCK =	2.766473	YSHOCK =	.349131	P2 =	.479170	P1 =	.272437	MACH2 =	1.067	MACH1 =	1.500
XSHOCK =	2.772275	YSHOCK =	.355522	P2 =	.481667	P1 =	.275345	MACH2 =	1.063	MACH1 =	1.492
XSHOCK =	2.777876	YSHOCK =	.361707	P2 =	.483610	P1 =	.277709	MACH2 =	1.060	MACH1 =	1.487
XSHOCK =	2.783266	YSHOCK =	.367674	P2 =	.485079	P1 =	.279500	MACH2 =	1.057	MACH1 =	1.482
XSHOCK =	2.788446	YSHOCK =	.373417	P2 =	.485989	P1 =	.280703	MACH2 =	1.056	MACH1 =	1.479
XSHOCK =	2.793484	YSHOCK =	.379008	P2 =	.486124	P1 =	.281332	MACH2 =	1.056	MACH1 =	1.478
XSHOCK =	2.798400	YSHOCK =	.384465	P2 =	.486115	P1 =	.281364	MACH2 =	1.056	MACH1 =	1.477
XSHOCK =	2.803224	YSHOCK =	.389818	P2 =	.485418	P1 =	.280736	MACH2 =	1.057	MACH1 =	1.479
XSHOCK =	2.807960	YSHOCK =	.395041	P2 =	.481637	P1 =	.278379	MACH2 =	1.064	MACH1 =	1.485
XSHOCK =	2.812646	YSHOCK =	.400121	P2 =	.471728	P1 =	.276351	MACH2 =	1.081	MACH1 =	1.490
XSHOCK =	2.817389	YSHOCK =	.405180	P2 =	.467246	P1 =	.274498	MACH2 =	1.090	MACH1 =	1.495
XSHOCK =	2.822036	YSHOCK =	.410115	P2 =	.465229	P1 =	.272853	MACH2 =	1.093	MACH1 =	1.499
XSHOCK =	2.826850	YSHOCK =	.415213	P2 =	.462068	P1 =	.271320	MACH2 =	1.098	MACH1 =	1.503
XSHOCK =	2.831244	YSHOCK =	.419847	P2 =	.459648	P1 =	.270115	MACH2 =	1.103	MACH1 =	1.506
XSHOCK =	2.835540	YSHOCK =	.424364	P2 =	.457750	P1 =	.269116	MACH2 =	1.106	MACH1 =	1.508
XSHOCK =	2.839767	YSHOCK =	.428799	P2 =	.456333	P1 =	.268319	MACH2 =	1.109	MACH1 =	1.510
XSHOCK =	2.843211	YSHOCK =	.432407	P2 =	.455287	P1 =	.267832	MACH2 =	1.110	MACH1 =	1.512
XSHOCK =	2.846683	YSHOCK =	.436039	P2 =	.454666	P1 =	.267471	MACH2 =	1.112	MACH1 =	1.512
XSHOCK =	2.850928	YSHOCK =	.440477	P2 =	.454315	P1 =	.267193	MACH2 =	1.112	MACH1 =	1.513
XSHOCK =	2.855990	YSHOCK =	.445771	P2 =	.455097	P1 =	.267139	MACH2 =	1.111	MACH1 =	1.513
XSHOCK =	2.860270	YSHOCK =	.450261	P2 =	.457314	P1 =	.267637	MACH2 =	1.107	MACH1 =	1.512
XSHOCK =	2.864498	YSHOCK =	.454709	P2 =	.460023	P1 =	.267672	MACH2 =	1.101	MACH1 =	1.512
XSHOCK =	2.868844	YSHOCK =	.459293	P2 =	.462546	P1 =	.269437	MACH2 =	1.097	MACH1 =	1.507
XSHOCK =	2.874230	YSHOCK =	.465020	P2 =	.467202	P1 =	.271420	MACH2 =	1.089	MACH1 =	1.502
XSHOCK =	2.880216	YSHOCK =	.471472	P2 =	.473518	P1 =	.273286	MACH2 =	1.077	MACH1 =	1.498
XSHOCK =	2.886317	YSHOCK =	.478137	P2 =	.477418	P1 =	.274749	MACH2 =	1.070	MACH1 =	1.494
XSHOCK =	2.892437	YSHOCK =	.484883	P2 =	.480286	P1 =	.275700	MACH2 =	1.065	MACH1 =	1.492
XSHOCK =	2.898317	YSHOCK =	.491406	P2 =	.481898	P1 =	.276044	MACH2 =	1.062	MACH1 =	1.491
XSHOCK =	2.904241	YSHOCK =	.497994	P2 =	.481618	P1 =	.275756	MACH2 =	1.063	MACH1 =	1.491
XSHOCK =	2.910236	YSHOCK =	.504634	P2 =	.477979	P1 =	.274016	MACH2 =	1.069	MACH1 =	1.496
XSHOCK =	2.916306	YSHOCK =	.511302	P2 =	.473844	P1 =	.271065	MACH2 =	1.075	MACH1 =	1.503
XSHOCK =	2.922322	YSHOCK =	.517845	P2 =	.468454	P1 =	.269255	MACH2 =	1.085	MACH1 =	1.507
XSHOCK =	2.928271	YSHOCK =	.524253	P2 =	.464421	P1 =	.267821	MACH2 =	1.093	MACH1 =	1.511
XSHOCK =	2.934142	YSHOCK =	.530537	P2 =	.461320	P1 =	.266786	MACH2 =	1.098	MACH1 =	1.514
XSHOCK =	2.939931	YSHOCK =	.536705	P2 =	.459344	P1 =	.266188	MACH2 =	1.102	MACH1 =	1.516
XSHOCK =	2.945642	YSHOCK =	.542776	P2 =	.458590	P1 =	.266070	MACH2 =	1.103	MACH1 =	1.516
XSHOCK =	2.951289	YSHOCK =	.548786	P2 =	.459821	P1 =	.266094	MACH2 =	1.101	MACH1 =	1.515
XSHOCK =	2.956892	YSHOCK =	.554773	P2 =	.462631	P1 =	.267778	MACH2 =	1.096	MACH1 =	1.512

XSHOCK =	2.962471	YSHOCK =	.560764	P2 =	.465018	P1 =	.269397	MACH2 =	1.092	MACH1 =	1.507
XSHOCK =	2.968048	YSHOCK =	.566782	P2 =	.467418	P1 =	.270774	MACH2 =	1.088	MACH1 =	1.504
XSHOCK =	2.973638	YSHOCK =	.572853	P2 =	.470225	P1 =	.271891	MACH2 =	1.083	MACH1 =	1.501
XSHOCK =	2.979254	YSHOCK =	.578992	P2 =	.472250	P1 =	.272684	MACH2 =	1.079	MACH1 =	1.499
XSHOCK =	2.984907	YSHOCK =	.585198	P2 =	.473384	P1 =	.273117	MACH2 =	1.077	MACH1 =	1.498
XSHOCK =	2.990598	YSHOCK =	.591455	P2 =	.472810	P1 =	.273107	MACH2 =	1.078	MACH1 =	1.498
XSHOCK =	2.996329	YSHOCK =	.597736	P2 =	.470055	P1 =	.272033	MACH2 =	1.082	MACH1 =	1.500
XSHOCK =	3.000000	YSHOCK =	.601731	P2 =	.466650	P1 =	.271413	MACH2 =	1.089	MACH1 =	1.502

X/R = 3.0000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
16	1.0211	1.1852	-.1303	.5946	.2499	.3202	1.2287		1.4693
15	.9708	1.2832	-.1409	.6786	.2506	.3331	1.3040		.9115
14	.9292	1.3657	-.1505	.7622	.2513	.3450	1.3637		.7739
13	.8923	1.4277	-.1580	.8324	.2515	.3541	1.4064		.6563
12	.8529	1.4677	-.1675	.8874	.2533	.3624	1.4318		.5806
11	.8151	1.5007	-.1719	.9295	.2530	.3669	1.4530		.5450
10	.7744	1.5137	-.1814	.9611	.2567	.3743	1.4593		.5322
9	.7341	1.5311	-.1811	.9820	.2557	.3756	1.4708		.5277
8	.6905	1.5236	-.1880	.9930	.2614	.3827	1.4642		.5265
7	.6458	1.5256	-.1827	.9976	.2618	.3837	1.4669		.5304
	.6017	1.5019	-.1862	.9993	.2714	.3939	1.4503	1.0833	.0000
	.6017	1.0894	-.0006	.9833	.4667	.5774	1.1588	1.0833	.0000
6	.5975	1.0873	-.0007	.9828	.4676	.5781	1.1570		.5826
5	.5540	1.0795	-.0035	.9833	.4723	.5824	1.1503		.5953
4	.5061	1.1045	-.0026	.9823	.4575	.5691	1.1717		.6013
3	.4521	1.1184	.0004	.9839	.4504	.5631	1.1835		.5922
2	.3933	1.0964	-.0041	.9833	.4626	.5738	1.1648		.5933
1	.3197	1.0874	-.0033	.9807	.4665	.5769	1.1570		.6072
8	.3197	1.0874	-.0033	.9807	.4665	.5769	1.1570		.6072
7	.2972	1.0842	-.0034	.9875	.4716	.5824	1.1543		.6180
6	.2710	1.0718	-.0041	.9824	.4763	.5858	1.1436		.6219
5	.2429	1.0671	-.0036	.9852	.4804	.5899	1.1395		.6283
4	.2118	1.0528	-.0052	.9826	.4876	.5957	1.1270		.6327
3	.1704	1.0589	-.0017	.9800	.4827	.5909	1.1324		.6489
2	.1266	1.0493	-.0003	.9650	.4808	.5867	1.1240		.6862
1	.0000	1.0239	.0000	.9349	.4802	.5809	1.1015		.6982

XSHOCK =	3.005815	YSHOCK =	.608019	P2 =	.463982	P1 =	.270530	MACH2 =	1.094	MACH1 =	1.504
XSHOCK =	3.011629	YSHOCK =	.614288	P2 =	.462276	P1 =	.269864	MACH2 =	1.097	MACH1 =	1.505
XSHOCK =	3.017443	YSHOCK =	.620544	P2 =	.460708	P1 =	.269451	MACH2 =	1.099	MACH1 =	1.506
XSHOCK =	3.023253	YSHOCK =	.626788	P2 =	.459779	P1 =	.269340	MACH2 =	1.101	MACH1 =	1.506
XSHOCK =	3.029056	YSHOCK =	.633025	P2 =	.460058	P1 =	.269585	MACH2 =	1.100	MACH1 =	1.506
XSHOCK =	3.034849	YSHOCK =	.639273	P2 =	.462114	P1 =	.270267	MACH2 =	1.096	MACH1 =	1.504
XSHOCK =	3.040628	YSHOCK =	.645533	P2 =	.463410	P1 =	.270492	MACH2 =	1.093	MACH1 =	1.503
XSHOCK =	3.046394	YSHOCK =	.651794	P2 =	.463809	P1 =	.271121	MACH2 =	1.092	MACH1 =	1.500
XSHOCK =	3.052144	YSHOCK =	.658060	P2 =	.464642	P1 =	.271578	MACH2 =	1.090	MACH1 =	1.499
XSHOCK =	3.057880	YSHOCK =	.664330	P2 =	.464773	P1 =	.271846	MACH2 =	1.089	MACH1 =	1.497
XSHOCK =	3.063597	YSHOCK =	.670593	P2 =	.464415	P1 =	.271904	MACH2 =	1.088	MACH1 =	1.497
XSHOCK =	3.069294	YSHOCK =	.676826	P2 =	.462420	P1 =	.271428	MACH2 =	1.092	MACH1 =	1.497
XSHOCK =	3.074970	YSHOCK =	.683016	P2 =	.460406	P1 =	.270444	MACH2 =	1.094	MACH1 =	1.498
XSHOCK =	3.080623	YSHOCK =	.689167	P2 =	.457790	P1 =	.269950	MACH2 =	1.097	MACH1 =	1.498
XSHOCK =	3.086257	YSHOCK =	.695287	P2 =	.455660	P1 =	.269580	MACH2 =	1.099	MACH1 =	1.498
XSHOCK =	3.091873	YSHOCK =	.701386	P2 =	.454073	P1 =	.269362	MACH2 =	1.101	MACH1 =	1.497
XSHOCK =	3.097475	YSHOCK =	.707473	P2 =	.452795	P1 =	.269326	MACH2 =	1.102	MACH1 =	1.496
XSHOCK =	3.103069	YSHOCK =	.713561	P2 =	.452387	P1 =	.269463	MACH2 =	1.101	MACH1 =	1.494

XSHOCK =	3.108662	YSHOCK =	.719670	P2 =	.451910	P1 =	.269358	MACH2 =	1.099	MACH1 =	1.492
XSHOCK =	3.114264	YSHOCK =	.725816	P2 =	.450503	P1 =	.269238	MACH2 =	1.098	MACH1 =	1.489
XSHOCK =	3.119885	YSHOCK =	.732018	P2 =	.449901	P1 =	.269065	MACH2 =	1.095	MACH1 =	1.486
XSHOCK =	3.125534	YSHOCK =	.738288	P2 =	.448728	P1 =	.268850	MACH2 =	1.094	MACH1 =	1.484
XSHOCK =	3.131220	YSHOCK =	.744635	P2 =	.447976	P1 =	.268613	MACH2 =	1.092	MACH1 =	1.481
XSHOCK =	3.136950	YSHOCK =	.751068	P2 =	.446568	P1 =	.268091	MACH2 =	1.090	MACH1 =	1.479
XSHOCK =	3.142730	YSHOCK =	.757601	P2 =	.444704	P1 =	.267552	MACH2 =	1.088	MACH1 =	1.476
XSHOCK =	3.148564	YSHOCK =	.764254	P2 =	.443318	P1 =	.267102	MACH2 =	1.085	MACH1 =	1.472
XSHOCK =	3.154453	YSHOCK =	.771042	P2 =	.442494	P1 =	.266777	MACH2 =	1.080	MACH1 =	1.467
XSHOCK =	3.160400	YSHOCK =	.777976	P2 =	.441787	P1 =	.266618	MACH2 =	1.076	MACH1 =	1.463
XSHOCK =	3.166403	YSHOCK =	.785060	P2 =	.441372	P1 =	.266498	MACH2 =	1.070	MACH1 =	1.458
XSHOCK =	3.172461	YSHOCK =	.792322	P2 =	.441157	P1 =	.265997	MACH2 =	1.062	MACH1 =	1.452
XSHOCK =	3.178575	YSHOCK =	.799805	P2 =	.440695	P1 =	.265416	MACH2 =	1.053	MACH1 =	1.445
XSHOCK =	3.184741	YSHOCK =	.807534	P2 =	.440619	P1 =	.264871	MACH2 =	1.042	MACH1 =	1.437
XSHOCK =	3.190955	YSHOCK =	.815523	P2 =	.440314	P1 =	.264404	MACH2 =	1.032	MACH1 =	1.430
XSHOCK =	3.197216	YSHOCK =	.823793	P2 =	.440420	P1 =	.263536	MACH2 =	1.020	MACH1 =	1.422
XSHOCK =	3.201574	YSHOCK =	.829716	P2 =	.440684	P1 =	.262869	MACH2 =	1.010	MACH1 =	1.416
XSHOCK =	3.206880	YSHOCK =	.837129	P2 =	.439162	P1 =	.262277	MACH2 =	1.000	MACH1 =	1.407
XSHOCK =	3.212666	YSHOCK =	.845364	P2 =	.432547	P1 =	.261848	MACH2 =	1.000	MACH1 =	1.397
XSHOCK =	3.218333	YSHOCK =	.853501	P2 =	.426221	P1 =	.261600	MACH2 =	1.000	MACH1 =	1.386
XSHOCK =	3.223299	YSHOCK =	.860696	P2 =	.420092	P1 =	.261124	MACH2 =	1.000	MACH1 =	1.376
XSHOCK =	3.227741	YSHOCK =	.867203	P2 =	.414155	P1 =	.260306	MACH2 =	1.000	MACH1 =	1.368
XSHOCK =	3.231478	YSHOCK =	.872493	P2 =	.388682	P1 =	.260068	MACH2 =	1.043	MACH1 =	1.357
XSHOCK =	3.235107	YSHOCK =	.877614	P2 =	.398663	P1 =	.260248	MACH2 =	1.010	MACH1 =	1.347
XSHOCK =	3.238643	YSHOCK =	.882871	P2 =	.397133	P1 =	.260787	MACH2 =	1.000	MACH1 =	1.335
XSHOCK =	3.242100	YSHOCK =	.888101	P2 =	.391803	P1 =	.261700	MACH2 =	1.000	MACH1 =	1.322
XSHOCK =	3.245490	YSHOCK =	.893274	P2 =	.386838	P1 =	.261501	MACH2 =	1.000	MACH1 =	1.312
XSHOCK =	3.248831	YSHOCK =	.898435	P2 =	.381602	P1 =	.261544	MACH2 =	1.000	MACH1 =	1.302
XSHOCK =	3.252127	YSHOCK =	.903049	P2 =	.328704	P1 =	.259759	MACH2 =	1.115	MACH1 =	1.296
XSHOCK =	3.255357	YSHOCK =	.907143	P2 =	.331936	P1 =	.258828	MACH2 =	1.097	MACH1 =	1.290
XSHOCK =	3.258534	YSHOCK =	.911388	P2 =	.338700	P1 =	.258488	MACH2 =	1.070	MACH1 =	1.281
XSHOCK =	3.261864	YSHOCK =	.916219	P2 =	.351152	P1 =	.258806	MACH2 =	1.028	MACH1 =	1.270
XSHOCK =	3.265295	YSHOCK =	.921674	P2 =	.356849	P1 =	.260053	MACH2 =	1.001	MACH1 =	1.255
XSHOCK =	3.268792	YSHOCK =	.927511	P2 =	.350977	P1 =	.262638	MACH2 =	1.001	MACH1 =	1.235
XSHOCK =	3.272329	YSHOCK =	.933531	P2 =	.345397	P1 =	.263835	MACH2 =	1.001	MACH1 =	1.219
XSHOCK =	3.275890	YSHOCK =	.939756	P2 =	.340112	P1 =	.265738	MACH2 =	1.002	MACH1 =	1.201
XSHOCK =	3.279435	YSHOCK =	.945910	P2 =	.325142	P1 =	.262383	MACH2 =	1.025	MACH1 =	1.198
XSHOCK =	3.282971	YSHOCK =	.952116	P2 =	.327011	P1 =	.259498	MACH2 =	1.006	MACH1 =	1.194
XSHOCK =	3.286785	YSHOCK =	.959155	P2 =	.322583	P1 =	.256606	MACH2 =	1.002	MACH1 =	1.188
XSHOCK =	3.290760	YSHOCK =	.966725	P2 =	.316792	P1 =	.253982	MACH2 =	1.000	MACH1 =	1.180
XSHOCK =	3.294830	YSHOCK =	.974694	P2 =	.310516	P1 =	.251784	MACH2 =	1.000	MACH1 =	1.172
XSHOCK =	3.298828	YSHOCK =	.982694	P2 =	.306639	P1 =	.250839	MACH2 =	1.000	MACH1 =	1.165
XSHOCK =	3.302745	YSHOCK =	.984718	P2 =	.304175	P1 =	.250876	MACH2 =	1.001	MACH1 =	1.158

X/P = 3.4000

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
16	.9971	1.1523	.1836	.5699	.2499	.3163	1.1920		1.4553
15	.9453	1.2020	.1744	.6440	.2649	.3414	1.2341		.9320
14	.9050	1.2251	.1524	.7173	.2862	.3721	1.2568		.8183
13	.8689	1.2408	.1267	.7822	.3057	.3998	1.2736		.7303
12	.8310	1.2476	.0982	.8402	.3254	.4267	1.2829		.6528
11	.7966	1.2177	.0714	.8923	.3596	.4662	1.2621		.6174
10	.7586	1.2000	.0563	.9335	.3850	.4958	1.2491		.5900
9	.7235	1.2372	.0553	.9614	.3775	.4931	1.2789		.5818
8	.6839	1.2584	.0565	.9752	.3723	.4902	1.2955		.5816
7	.6448	1.2395	.0523	.9811	.3841	.5021	1.2809		.5824
6	.6019	1.2184	.0383	.9825	.3955	.5129	1.2650		.5827
5	.5575	1.1918	.0281	.9833	.4098	.5262	1.2440		.5759
4	.5080	1.1703	.0194	.9823	.4210	.5363	1.2266		.5758
3	.4548	1.1604	.0153	.9839	.4270	.5421	1.2185		.5707
2	.3957	1.1540	.0136	.9833	.4303	.5449	1.2132		.5716
1	.3218	1.1457	.0123	.9807	.4337	.5475	1.2064		.5842

	Y	MACH NUMBER	FLOW ANGLE	TOTAL PRESSURE	STATIC PRESSURE	DENSITY	U-VELOCITY	SHOCK ANGLE	TURBULENCE INTEN.
8	.3218	1.1457	.0123	.9807	.4337	.5475	1.2064		.5842
7	.2990	1.1522	.0096	.9875	.4331	.5481	1.2118		.5901
6	.2727	1.1468	.0091	.9824	.4339	.5480	1.2073		.5959
5	.2443	1.1486	.0081	.9852	.4341	.5487	1.2088		.6019
4	.2130	1.1462	.0073	.9826	.4343	.5484	1.2069		.6094
3	.1713	1.1417	.0057	.9800	.4356	.5492	1.2031		.6239
2	.1271	1.1268	.0038	.9650	.4371	.5481	1.1906		.6499
1	.0000	1.1005	.0000	.9349	.4376	.5436	1.1683		.6583

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EXECUTING PROGM=MERGE
TAPIN= T      TAPOT= T
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MERGED JETMIX AND SSFD PROFILE
FOR X = .0100

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
2	.11705	2.7320E-04	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
3	.16778	5.4641E-04	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
4	.20578	8.1961E-04	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
5	.23818	1.0928E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
6	.26692	1.3660E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
7	.29188	1.6392E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
8	.31620	1.9124E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
9	.38706	2.8688E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
10	.44680	3.8252E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
11	.49978	4.7816E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
12	.54760	5.7380E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
13	.59137	6.6944E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
14	.63220	7.6508E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
15	.67058	8.6072E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
16	.70689	9.5636E-03	.746685	1.229104	9.1587E-01	1.2396E-01	3.9926E-03
17	.74146	1.0520E-02	.746684	1.229105	9.1587E-01	1.2396E-01	3.9926E-03
18	.77654	1.1476E-02	.746663	1.229120	9.1587E-01	1.2397E-01	3.9926E-03
19	.80614	1.2433E-02	.746517	1.229226	9.1587E-01	1.2309E-01	3.9926E-03
20	.83647	1.3389E-02	.746711	1.229086	9.1587E-01	1.2396E-01	3.9926E-03
21	.86581	1.4346E-02	.751980	1.225247	9.1586E-01	1.2209E-01	3.9926E-03
22	.89030	1.5302E-02	.774921	1.208426	9.1586E-01	1.1866E-01	3.9926E-03
23	.92196	1.6258E-02	.810545	1.187326	9.1594E-01	1.1095E-01	3.9926E-03
24	.94894	1.7215E-02	.855710	1.026616	9.1672E-01	1.0159E-01	3.9926E-03
25	.97597	1.8171E-02	.803674	.688799	9.1928E-01	1.1105E-01	3.9926E-03
26	1.00565	1.9128E-02					
27	5.55439	1.9211E-02	.000074	1.000000	1.3304E-04	7.6488E-02	3.9926E-03
28	3307.54487	1.9295E-02	.000000	1.000000	5.1793E-10	7.6488E-02	3.9926E-03
29	*2554.94203	1.9379E-02	.000000	1.000000	1.3441E-15	7.6488E-02	3.9926E-03
30	*7085.37485	1.9463E-02	.000000	1.000000	.0	7.6488E-02	3.9926E-03

MERGED JETMIX AND SSFD PROFILE
FOR X = .0200

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
2	.11745	2.7320E-04	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
3	.16778	5.4641E-04	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
4	.20578	8.1961E-04	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
5	.23818	1.0928E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
6	.26602	1.3660E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
7	.29188	1.6392E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
8	.31620	1.9124E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
9	.38706	2.8688E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
10	.44680	3.8252E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
11	.49978	4.7816E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
12	.54760	5.7380E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
13	.59137	6.6944E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
14	.63220	7.6508E-03	.746568	1.228717	8.5501E-01	1.2400E-01	3.8930E-03
15	.67058	8.6072E-03	.746567	1.228718	8.5501E-01	1.2400E-01	3.8930E-03
16	.70689	9.5636E-03	.746561	1.228722	8.5501E-01	1.2400E-01	3.8930E-03
17	.74146	1.0520E-02	.746549	1.228731	8.5501E-01	1.2400E-01	3.8930E-03
18	.77454	1.1476E-02	.746727	1.228601	8.5501E-01	1.2397E-01	3.8930E-03
19	.80614	1.2433E-02	.748357	1.227417	8.5501E-01	1.2367E-01	3.8930E-03
20	.83649	1.3389E-02	.754335	1.223051	8.5501E-01	1.2258E-01	3.8930E-03
21	.86570	1.4346E-02	.768200	1.212792	8.5504E-01	1.2002E-01	3.8930E-03
22	.89456	1.5302E-02	.789724	1.196490	8.5519E-01	1.1602E-01	3.8930E-03
23	.92256	1.6258E-02	.829657	1.165426	8.5576E-01	1.0838E-01	3.8930E-03
24	.95050	1.7215E-02	.871610	1.134794	8.5724E-01	9.8762E-02	3.8930E-03
25	.97901	1.8171E-02	.897038	.990449	8.6064E-01	8.9824E-02	3.8930E-03
26	1.01195	1.9128E-02	.792420	.720104	8.6620E-01	1.0622E-01	3.8930E-03
27	1.26388	1.9211E-02	.003924	1.000000	1.5762E-02	7.6488E-02	3.8930E-03
28	98.07871	1.9295E-02	.000000	1.000000	9.6255E-07	7.6488E-02	3.8930E-03
29	78258.70920	1.9379E-02	.000000	1.000000	6.0196E-12	7.6488E-02	3.8930E-03
30	*0674.48446	1.9463E-02	.000000	1.000000	.0	7.6488E-02	3.8930E-03

MERGED JETMIX AND SSED PROFILE
FOR X = .0400

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
2	.11745	2.7320E-04	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
3	.16778	5.4641E-04	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
4	.20578	8.1951E-04	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
5	.23818	1.0928E-03	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
6	.26692	1.3660E-03	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
7	.29188	1.6392E-03	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
8	.31620	1.9124E-03	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
9	.38706	2.8689E-03	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
10	.44680	3.8252E-03	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
11	.49978	4.7816E-03	.746386	1.228120	7.7098E-01	1.2406E-01	5.3871E-03
12	.54760	5.7380E-03	.746392	1.228116	7.7098E-01	1.2406E-01	5.3871E-03
13	.59137	6.6944E-03	.746456	1.228069	7.7098E-01	1.2405E-01	5.3871E-03
14	.63220	7.6509E-03	.746851	1.227782	7.7098E-01	1.2398E-01	5.3871E-03
15	.67058	8.6072E-03	.748368	1.226679	7.7098E-01	1.2370E-01	5.3871E-03
16	.70692	9.5636E-03	.752229	1.223863	7.7099E-01	1.2299E-01	5.3871E-03
17	.74153	1.0520E-02	.759347	1.218633	7.7102E-01	1.2168E-01	5.3871E-03
18	.77470	1.1476E-02	.769999	1.210715	7.7112E-01	1.1971E-01	5.3871E-03
19	.80650	1.2433E-02	.784958	1.199408	7.7138E-01	1.1694E-01	5.3871E-03
20	.83718	1.3389E-02	.804223	1.184526	7.7194E-01	1.1334E-01	5.3871E-03
21	.86709	1.4346E-02	.831977	1.162463	7.7296E-01	1.0813E-01	5.3871E-03
22	.89673	1.5302E-02	.863450	1.136516	7.7470E-01	1.0219E-01	5.3871E-03
23	.92589	1.6258E-02	.911465	1.095735	7.7761E-01	9.2848E-02	5.3871E-03
24	.95632	1.7215E-02	.942791	1.065853	7.8218E-01	8.4067E-02	5.3871E-03
25	.99738	1.8171E-02	.926101	.961191	7.8881E-01	7.7942E-02	5.3871E-03
26	1.02537	1.9128E-02	.761598	.796478	7.9555E-01	9.6033E-02	5.3871E-03
27	1.03741	1.9211E-02	.131022	1.000000	1.0773E+00	7.6488E-02	5.3871E-03
28	1.25112	1.9295E-02	.004642	1.000000	2.9876E-02	7.6488E-02	5.3871E-03
29	60.94824	1.9379E-02	.000001	1.000000	6.6810E-06	7.6488E-02	5.3871E-03
30	86.18475	1.9463E-02	.000000	1.000000	.0	7.6488E-02	5.3871E-03

MERGED JETMIX AND SSFD PROFILE
FOR X = .0600

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.746246	1.227659	7.1426E-01	1.2411E-01	5.3880E-03
2	.11745	2.7320E-04	.746246	1.227659	7.1426E-01	1.2411E-01	5.3880E-03
3	.16778	5.4641E-04	.746246	1.227659	7.1426E-01	1.2411E-01	5.3880E-03
4	.20578	8.1961E-04	.746246	1.227659	7.1426E-01	1.2411E-01	5.3880E-03
5	.23818	1.0928E-03	.746246	1.227659	7.1426E-01	1.2411E-01	5.3880E-03
6	.26622	1.3660E-03	.746246	1.227659	7.1426E-01	1.2411E-01	5.3880E-03
7	.29188	1.6392E-03	.746247	1.227658	7.1426E-01	1.2411E-01	5.3880E-03
8	.31620	1.9124E-03	.746270	1.227602	7.1426E-01	1.2410E-01	5.3880E-03
9	.35706	2.8688E-03	.746270	1.227642	7.1426E-01	1.2410E-01	5.3880E-03
10	.40680	3.8252E-03	.746409	1.227541	7.1426E-01	1.2408E-01	5.3880E-03
11	.49979	4.7816E-03	.747016	1.227100	7.1426E-01	1.2397E-01	5.3880E-03
12	.54761	5.7380E-03	.748834	1.225778	7.1426E-01	1.2363E-01	5.3880E-03
13	.59141	6.6944E-03	.752693	1.222962	7.1427E-01	1.2272E-01	5.3880E-03
14	.63229	7.6508E-03	.758943	1.218369	7.1431E-01	1.2177E-01	5.3880E-03
15	.67077	8.6072E-03	.767502	1.211989	7.1441E-01	1.2018E-01	5.3880E-03
16	.70726	9.5636E-03	.778469	1.203777	7.1464E-01	1.1816E-01	5.3880E-03
17	.74211	1.0520E-02	.792181	1.193308	7.1506E-01	1.1561E-01	5.3880E-03
18	.77563	1.1476E-02	.808817	1.180345	7.1575E-01	1.1249E-01	5.3880E-03
19	.80782	1.2433E-02	.830278	1.163262	7.1681E-01	1.0847E-01	5.3880E-03
20	.83929	1.3389E-02	.854742	1.143225	7.1839E-01	1.0386E-01	5.3880E-03
21	.87006	1.4346E-02	.888381	1.114750	7.2068E-01	9.7500E-02	5.3880E-03
22	.90117	1.5302E-02	.921015	1.086011	7.2399E-01	9.1327E-02	5.3880E-03
23	.93170	1.6258E-02	.967129	1.044428	7.2866E-01	8.2320E-02	5.3880E-03
24	.96467	1.7215E-02	.977679	1.025819	7.3502E-01	7.6268E-02	5.3880E-03
25	.99710	1.8171E-02	.934447	.947876	7.4227E-01	7.0367E-02	5.3880E-03
26	1.04052	1.9128E-02	.692589	.851856	7.4818E-01	8.9790E-02	5.3880E-03
27	1.04874	1.9211E-02	.222171	1.000000	2.3133E+00	7.6488E-02	5.3880E-03
28	1.06420	1.9295E-02	.096177	1.000000	7.1313E-01	7.6486E-02	5.3880E-03
29	1.41511	1.9379E-02	.002588	1.000000	1.5612E-02	7.6488E-02	5.3880E-03
30	1.69486	1.9463E-02	.000000	1.000000	.0	7.6088E-02	5.3880E-03

MERGED JETMIX AND SSFD PROFILE
FOR X = .1000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.746050	1.226827	6.4009E-01	1.2418E-01	6.3501E-03
2	.11745	2.7320E-04	.746193	1.226723	6.4009E-01	1.2415E-01	6.3501E-03
3	.16778	5.4641E-04	.746623	1.226411	6.4010E-01	1.2407E-01	6.3501E-03
4	.20579	8.1961E-04	.747377	1.225864	6.4011E-01	1.2394E-01	6.3501E-03
5	.23812	1.0928E-03	.748367	1.225144	6.4013E-01	1.2375E-01	6.3501E-03
6	.26695	1.3660E-03	.749491	1.224326	6.4015E-01	1.2355E-01	6.3501E-03
7	.29191	1.6392E-03	.750995	1.223229	6.4019E-01	1.2327E-01	6.3501E-03
8	.31626	1.9124E-03	.752203	1.222346	6.4019E-01	1.2305E-01	6.3501E-03
9	.38715	2.8698E-03	.755309	1.220004	6.4022E-01	1.2246E-01	6.3501E-03
10	.44701	3.8252E-03	.763928	1.213705	6.4022E-01	1.2089E-01	6.3501E-03
11	.50018	4.7816E-03	.772787	1.207087	6.4032E-01	1.1924E-01	6.3501E-03
12	.54827	5.7380E-03	.783065	1.199314	6.4064E-01	1.1733E-01	6.3501E-03
13	.59243	6.6944E-03	.794712	1.190382	6.4110E-01	1.1516E-01	6.3501E-03
14	.63378	7.6508E-03	.807985	1.180041	6.4176E-01	1.1268E-01	6.3501E-03
15	.67287	8.6072E-03	.823378	1.167834	6.4265E-01	1.0979E-01	6.3501E-03
16	.71014	9.5636E-03	.840773	1.153763	6.4382E-01	1.0651E-01	6.3501E-03
17	.74597	1.0520E-02	.861497	1.136615	6.4535E-01	1.0259E-01	6.3501E-03
18	.78081	1.1476E-02	.883752	1.117734	6.4732E-01	9.8387E-02	6.3501E-03
19	.81458	1.2433E-02	.911590	1.093360	6.4985E-01	9.3110E-02	6.3501E-03
20	.84822	1.3389E-02	.937844	1.069846	6.5312E-01	8.8183E-02	6.3501E-03
21	.88107	1.4346E-02	.974282	1.036053	6.5716E-01	8.1366E-02	6.3501E-03
22	.91581	1.5302E-02	.996206	1.014879	6.6237E-01	7.7278E-02	6.3501E-03
23	.94806	1.6258E-02	1.035776	.975834	6.6831E-01	6.9528E-02	6.3501E-03
24	.98524	1.7215E-02	.961989	1.024760	6.7570E-01	7.5879E-02	6.3501E-03
25	1.02657	1.8351E-02	.805950	.987910	6.8198E-01	7.7424E-02	6.3501E-03
26	1.02745	1.8387E-02	.723282	1.000000	2.8310E+00	7.6488E-02	6.3501E-03
27	1.04425	1.8795E-02	.531675	1.000000	3.0919E+00	7.6488E-02	6.3501E-03
28	1.05784	1.9044E-02	.397802	1.000000	2.9850E+00	7.6488E-02	6.3501E-03
29	1.06342	1.9128E-02	.346525	1.000000	2.7922E+00	7.6488E-02	6.3501E-03
30	1.06922	1.9211E-02	.290619	1.000000	2.4926E+00	7.6488E-02	6.3501E-03
31	1.07793	1.9295E-02	.227036	1.000000	2.0306E+00	7.6488E-02	6.3501E-03
32	1.08237	1.9379E-02	.144849	1.000000	1.1931E+00	7.6488E-02	6.3501E-03
33	1.14799	1.9463E-02	.018895	1.000000	8.7070E-02	7.6488E-02	6.3501E-03
34	8.93563	1.9547E-02	.000028	1.000000	1.2203E-04	7.6488E-02	6.3501E-03
35	12.58463	1.9631E-02	.000000	1.000000	.0	7.6488E-02	6.3501E-03

MERGED JETMIX AND SSFD PROFILE
FOR X = .2000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.809440	1.177232	5.2650E-01	1.1244E-01	7.2752E-03
2	.11857	2.7320E-04	.810446	1.176439	5.2664E-01	1.1225E-01	7.2752E-03
3	.16932	5.4641E-04	.813469	1.174054	5.2706E-01	1.1169E-01	7.2752E-03
4	.20784	8.1961E-04	.817402	1.170936	5.2747E-01	1.1095E-01	7.2752E-03
5	.24064	1.0928E-03	.821290	1.167539	5.2790E-01	1.1021E-01	7.2752E-03
6	.26984	1.3660E-03	.824735	1.165034	5.2833E-01	1.0955E-01	7.2752E-03
7	.29501	1.6392E-03	.830062	1.160797	5.2871E-01	1.0856E-01	7.2752E-03
8	.32019	1.9124E-03	.829810	1.161001	5.2871E-01	1.0861E-01	7.2752E-03
9	.39200	2.6688E-03	.841960	1.151127	5.2890E-01	1.0631E-01	7.2752E-03
10	.45365	3.8252E-03	.859556	1.136574	5.2890E-01	1.0299E-01	7.2752E-03
11	.50853	4.7816E-03	.875667	1.122984	5.3024E-01	9.9934E-02	7.2752E-03
12	.55872	5.7380E-03	.894045	1.107174	5.3238E-01	9.6454E-02	7.2752E-03
13	.60537	6.6944E-03	.913076	1.090457	5.3432E-01	9.2854E-02	7.2752E-03
14	.64964	7.6508E-03	.933137	1.072454	5.3673E-01	8.9069E-02	7.2752E-03
15	.69196	8.6072E-03	.954986	1.052400	5.3935E-01	8.4964E-02	7.2752E-03
16	.73322	9.5636E-03	.976297	1.032394	5.4237E-01	8.0983E-02	7.2752E-03
17	.77307	1.0520E-02	1.000416	1.009218	5.4572E-01	7.6515E-02	7.2752E-03
18	.81331	1.1476E-02	1.020632	.989357	5.4955E-01	7.2806E-02	7.2752E-03
19	.85140	1.2433E-02	1.041935	.968006	5.5367E-01	6.8940E-02	7.2752E-03
20	.89104	1.3389E-02	1.029685	.980388	5.5835E-01	7.1148E-02	7.2752E-03
21	.92508	1.4346E-02	1.027578	.982622	5.6311E-01	7.1484E-02	7.2752E-03
22	.96112	1.5302E-02	1.017993	.990628	5.7722E-01	7.2966E-02	7.2752E-03
23	.99114	1.6258E-02	.997798	1.002026	5.8307E-01	7.3904E-02	7.2752E-03
24	1.02614	1.7215E-02	.926862	1.017567	5.8994E-01	7.3669E-02	7.2752E-03
25	1.07054	1.8361E-02	.754627	1.009120	6.0738E-01	7.5797E-02	7.2752E-03
26	1.07144	1.8387E-02	.689385	1.000000	3.4282E+00	7.6488E-02	7.2752E-03
27	1.08742	1.8795E-02	.560269	1.000000	3.6187E+00	7.6488E-02	7.2752E-03
28	1.09908	1.9044E-02	.468057	1.000000	3.4364E+00	7.6488E-02	7.2752E-03
29	1.10351	1.9129E-02	.433732	1.000000	3.3084E+00	7.6488E-02	7.2752E-03
30	1.10828	1.9211E-02	.397506	1.000000	3.1432E+00	7.6488E-02	7.2752E-03
31	1.11352	1.9295E-02	.359004	1.000000	2.9360E+00	7.6488E-02	7.2752E-03
32	1.11934	1.9379E-02	.317653	1.000000	2.6803E+00	7.6488E-02	7.2752E-03
33	1.12600	1.9463E-02	.272485	1.000000	2.3654E+00	7.6488E-02	7.2752E-03
34	1.13394	1.9547E-02	.221576	1.000000	1.9719E+00	7.6488E-02	7.2752E-03
35	1.14431	1.9631E-02	.159643	1.000000	1.4460E+00	7.6488E-02	7.2752E-03
36	1.16637	1.9715E-02	.058843	1.000000	3.5816E-01	7.6488E-02	7.2752E-03
37	1.85709	1.9798E-02	.001069	1.000000	5.8366E-03	7.6488E-02	7.2752E-03
38	2.35311	1.9882E-02	.000000	1.000000	.0	7.6488E-02	7.2752E-03

MERGED JETMIX AND SSFD PROFILE
FOR X = .3000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.901778	1.099312	4.6094E-01	9.4998E-02	9.3823E-03
2	.12263	2.7320E-04	.902851	1.098371	4.6114E-01	9.4795E-02	9.3823E-03
3	.17482	5.4641E-04	.906074	1.095537	4.6176E-01	9.4184E-02	9.3823E-03
4	.21466	8.1961E-04	.911301	1.090919	4.6248E-01	9.3195E-02	9.3823E-03
5	.24856	1.0928E-03	.916042	1.086708	4.6313E-01	9.2298E-02	9.3823E-03
6	.27906	1.3660E-03	.919850	1.083310	4.6385E-01	9.1578E-02	9.3823E-03
7	.30464	1.6392E-03	.926325	1.077499	4.6428E-01	9.0355E-02	9.3823E-03
8	.33214	1.9124E-03	.920365	1.079262	4.6428E-01	9.0726E-02	9.3823E-03
9	.40654	2.8688E-03	.938655	1.066321	4.6457E-01	8.8030E-02	9.3823E-03
10	.47181	3.8252E-03	.958312	1.048195	4.6457E-01	8.4337E-02	9.3823E-03
11	.53009	4.7816E-03	.976020	1.031544	4.6680E-01	8.1027E-02	9.3823E-03
12	.58410	5.7390E-03	.995313	1.013057	4.6995E-01	7.7446E-02	9.3823E-03
13	.63457	6.6944E-03	1.014611	.994202	4.7271E-01	7.3892E-02	9.3823E-03
14	.68520	7.6508E-03	1.033682	.975215	4.7597E-01	7.0415E-02	9.3823E-03
15	.72776	8.6072E-03	1.052050	.956592	4.7927E-01	6.7101E-02	9.3823E-03
16	.77564	9.5636E-03	1.067904	.940254	4.8285E-01	6.4272E-02	9.3823E-03
17	.81833	1.0520E-02	1.053830	.954770	4.8654E-01	6.6778E-02	9.3823E-03
18	.85934	1.1476E-02	1.050829	.957843	4.9032E-01	6.7315E-02	9.3823E-03
19	.89615	1.2433E-02	1.036547	.972349	5.0188E-01	6.9897E-02	9.3823E-03
20	.93233	1.3389E-02	1.022811	.986155	5.0589E-01	7.2351E-02	9.3823E-03
21	.96901	1.4346E-02	1.018810	.989698	5.0984E-01	7.2872E-02	9.3823E-03
22	.99834	1.5302E-02	1.012620	.990695	5.1349E-01	7.3055E-02	9.3823E-03
23	1.02754	1.6258E-02	.976645	1.002728	5.1807E-01	7.3705E-02	9.3823E-03
24	1.06266	1.7215E-02	.886495	1.019893	5.2650E-01	7.3908E-02	9.3823E-03
25	1.10787	1.8361E-02	.719119	1.015806	5.6999E-01	7.5298E-02	9.3823E-03
26	1.10879	1.8387E-02	.660784	1.000000	3.3415E+00	7.6488E-02	9.3823E-03
27	1.12443	1.8795E-02	.564790	1.000000	3.4728E+00	7.6488E-02	9.3823E-03
28	1.13533	1.9044E-02	.495286	1.000000	3.3790E+00	7.6488E-02	9.3823E-03
29	1.13933	1.9128E-02	.470009	1.000000	3.3108E+00	7.6488E-02	9.3823E-03
30	1.14353	1.9211E-02	.443707	1.000000	3.2228E+00	7.6488E-02	9.3823E-03
31	1.14799	1.9295E-02	.416261	1.000000	3.1133E+00	7.6488E-02	9.3823E-03
32	1.15274	1.9379E-02	.387519	1.000000	2.9803E+00	7.6488E-02	9.3823E-03
33	1.15784	1.9463E-02	.357276	1.000000	2.8215E+00	7.6488E-02	9.3823E-03
34	1.16339	1.9547E-02	.325248	1.000000	2.6336E+00	7.6488E-02	9.3823E-03
35	1.16951	1.9631E-02	.291019	1.000000	2.4120E+00	7.6488E-02	9.3823E-03
36	1.17640	1.9715E-02	.253930	1.000000	2.1096E+00	7.6488E-02	9.3823E-03
37	1.18442	1.9798E-02	.212815	1.000000	1.8332E+00	7.6488E-02	9.3823E-03
38	1.19433	1.9882E-02	.165093	1.000000	1.4297E+00	7.6488E-02	9.3823E-03
39	1.20896	1.9966E-02	.100246	1.000000	7.6557E-01	7.6488E-02	9.3823E-03
40	1.30424	2.0050E-02	.010075	1.000000	5.4150E-02	7.6488E-02	9.3823E-03
41	27.36917	2.0134E-02	.000003	1.000000	1.0381E-05	7.6488E-02	9.3823E-03
42	38.68387	2.0218E-02	.000000	1.000000	.0	7.6488E-02	9.3823E-03

MERGED JETMIX AND SSFD PROFILE
FOR X = .4000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.990457	1.016235	4.1983E-01	7.8337E-02	1.0768E-02
2	.12258	2.7320E-04	.991391	1.016036	4.2007E-01	7.8164E-02	1.0768E-02
3	.18397	5.4641E-04	.994203	1.013322	4.2079E-01	7.7643E-02	1.0768E-02
4	.22610	8.1961E-04	.999984	1.007718	4.2169E-01	7.6574E-02	1.0768E-02
5	.26176	1.0929E-03	1.005301	1.002535	4.2244E-01	7.5593E-02	1.0768E-02
6	.29434	1.3660E-03	1.008845	.999065	4.2335E-01	7.4941E-02	1.0768E-02
7	.32049	1.6392E-03	1.017687	.990355	4.2367E-01	7.3318E-02	1.0768E-02
8	.35177	1.9124E-03	1.013435	.994553	4.2367E-01	7.4098E-02	1.0768E-02
9	.43003	2.8688E-03	1.026309	.981789	4.2401E-01	7.1743E-02	1.0768E-02
10	.50035	3.8252E-03	1.045911	.962043	4.2401E-01	6.8190E-02	1.0768E-02
11	.56293	4.7814E-03	1.061922	.945638	4.2664E-01	6.5320E-02	1.0768E-02
12	.62174	5.7380E-03	1.078551	.928337	4.3017E-01	6.2373E-02	1.0768E-02
13	.67657	6.6944E-03	1.092547	.913566	4.3312E-01	5.9922E-02	1.0768E-02
14	.72874	7.6509E-03	1.080505	.926286	4.3651E-01	6.2025E-02	1.0768E-02
15	.77547	8.6072E-03	1.079003	.927862	4.3976E-01	6.2289E-02	1.0768E-02
16	.81964	9.5636E-03	1.062687	.944849	4.5039E-01	6.5180E-02	1.0768E-02
17	.85887	1.0520E-02	1.041910	.966105	4.5344E-01	6.8908E-02	1.0768E-02
18	.89629	1.1476E-02	1.034226	.973864	4.5611E-01	7.0297E-02	1.0768E-02
19	.93071	1.2433E-02	1.033966	.974128	4.5975E-01	7.0326E-02	1.0768E-02
20	.96566	1.3389E-02	1.026725	.981231	4.6271E-01	7.1525E-02	1.0768E-02
21	.99637	1.4346E-02	1.014968	.990718	4.6558E-01	7.3100E-02	1.0768E-02
22	1.02917	1.5302E-02	.998734	.995453	4.6869E-01	7.3891E-02	1.0768E-02
23	1.05802	1.6258E-02	.948045	1.006620	4.7377E-01	7.4124E-02	1.0768E-02
24	1.09355	1.7215E-02	.851196	1.021750	4.9136E-01	7.4260E-02	1.0768E-02
25	1.12243	1.7938E-02	.721974	1.047007	5.7902E-01	7.3054E-02	1.0768E-02

26	1.13761	1.8387E-02	.647996	1.000000	3.1802E+00	7.6488E-02	1.0768E-02
27	1.15304	1.8795E-02	.564456	1.000000	3.2663E+00	7.6488E-02	1.0768E-02
28	1.16354	1.9014E-02	.507809	1.000000	3.2075E+00	7.6488E-02	1.0768E-02
29	1.16732	1.9126E-02	.487539	1.000000	3.1652E+00	7.6488E-02	1.0768E-02
30	1.17126	1.9211E-02	.466635	1.000000	3.1108E+00	7.6488E-02	1.0768E-02
31	1.17535	1.9295E-02	.445044	1.000000	3.0437E+00	7.6488E-02	1.0768E-02
32	1.17965	1.9379E-02	.422703	1.000000	2.9628E+00	7.6488E-02	1.0768E-02
33	1.18417	1.9463E-02	.399536	1.000000	2.8674E+00	7.6488E-02	1.0768E-02
34	1.18894	1.9547E-02	.375446	1.000000	2.7562E+00	7.6488E-02	1.0768E-02
35	1.19402	1.9631E-02	.350310	1.000000	2.6278E+00	7.6488E-02	1.0768E-02
36	1.19936	1.9715E-02	.323967	1.000000	2.4804E+00	7.6488E-02	1.0768E-02
37	1.20535	1.9798E-02	.296197	1.000000	2.3118E+00	7.6488E-02	1.0768E-02
38	1.21181	1.9882E-02	.266686	1.000000	2.1187E+00	7.6488E-02	1.0768E-02
39	1.21903	1.9966E-02	.234952	1.000000	1.8961E+00	7.6488E-02	1.0768E-02
40	1.22732	2.0050E-02	.200180	1.000000	1.6359E+00	7.6488E-02	1.0768E-02
41	1.23730	2.0134E-02	.160691	1.000000	1.3209E+00	7.6488E-02	1.0768E-02
42	1.25076	2.0218E-02	.110455	1.000000	8.8799E-01	7.6488E-02	1.0768E-02
43	1.29206	2.0301E-02	.025742	1.000000	1.5229E-01	7.6488E-02	1.0768E-02
44	4.29430	2.0385E-02	.000131	1.000000	1.1016E-03	7.6488E-02	1.0768E-02
45	5.93402	2.0469E-02	.000000	1.000000	.0	7.6488E-02	1.0768E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = .5000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	1.069216	.937454	3.9058E-01	6.4010E-02	1.2175E-02
2	.13872	2.7320E-04	1.070752	.935856	3.9084E-01	6.3738E-02	1.2175E-02
3	.19627	5.4641E-04	1.075387	.931021	3.9163E-01	6.2918E-02	1.2175E-02
4	.24183	8.1961E-04	1.080705	.925447	3.9263E-01	6.1980E-02	1.2175E-02
5	.27948	1.0928E-03	1.087385	.918407	3.9341E-01	6.0808E-02	1.2175E-02
6	.31570	1.3660E-03	1.089202	.916434	3.9450E-01	6.0490E-02	1.2175E-02
7	.34153	1.6392E-03	1.095168	.910150	3.9471E-01	5.9451E-02	1.2175E-02
8	.37822	1.9124E-03	1.089550	.916116	3.9471E-01	6.0430E-02	1.2175E-02
9	.46060	2.8688E-03	1.100431	.904533	3.9483E-01	5.8538E-02	1.2175E-02
10	.53692	3.8252E-03	1.117977	.885611	3.9483E-01	5.5524E-02	1.2175E-02
11	.60396	4.7816E-03	1.128401	.874229	3.9755E-01	5.3757E-02	1.2175E-02
12	.66581	5.7380E-03	1.114233	.889674	4.0115E-01	5.6158E-02	1.2175E-02
13	.71984	6.6944E-03	1.105701	.898881	4.0394E-01	5.7624E-02	1.2175E-02
14	.76849	7.6508E-03	1.079206	.927021	4.1398E-01	6.2239E-02	1.2175E-02
15	.81106	8.6072E-03	1.054983	.952151	4.1636E-01	6.6543E-02	1.2175E-02
16	.85089	9.5636E-03	1.050864	.956367	4.2003E-01	6.7284E-02	1.2175E-02
17	.88847	1.0520E-02	1.048585	.958696	4.2275E-01	6.7693E-02	1.2175E-02
18	.92520	1.1476E-02	1.036427	.971011	4.2431E-01	6.9881E-02	1.2175E-02
19	.95821	1.2433E-02	1.026894	.980475	4.2668E-01	7.1556E-02	1.2175E-02
20	.99158	1.3389E-02	1.021853	.984660	4.2933E-01	7.2175E-02	1.2175E-02
21	1.02144	1.4346E-02	1.009950	.991069	4.3194E-01	7.3183E-02	1.2175E-02
22	1.05382	1.5302E-02	.983179	.998181	4.3493E-01	7.4249E-02	1.2175E-02
23	1.08237	1.6258E-02	.919565	1.010248	4.4271E-01	7.4515E-02	1.2175E-02
24	1.12731	1.7435E-02	.814474	1.009517	4.8207E-01	7.5767E-02	1.2175E-02

25	1.13925	1.7526E-02	.725173	1.000000	2.7250E+00	7.6488E-02	1.2175E-02
26	1.15810	1.8347E-02	.636414	1.000000	3.0135E+00	7.6488E-02	1.2175E-02
27	1.17340	1.8735E-02	.563555	1.000000	3.0696E+00	7.6488E-02	1.2175E-02
28	1.18365	1.9044E-02	.515188	1.000000	3.0251E+00	7.6488E-02	1.2175E-02
29	1.18730	1.9126E-02	.498032	1.000000	2.9947E+00	7.6488E-02	1.2175E-02
30	1.19107	1.9211E-02	.480440	1.000000	2.9564E+00	7.6488E-02	1.2175E-02
31	1.19497	1.9295E-02	.462384	1.000000	2.9095E+00	7.6488E-02	1.2175E-02
32	1.19901	1.9379E-02	.443830	1.000000	2.8537E+00	7.6488E-02	1.2175E-02
33	1.20322	1.9463E-02	.424740	1.000000	2.7886E+00	7.6488E-02	1.2175E-02
34	1.20760	1.9547E-02	.405069	1.000000	2.7136E+00	7.6488E-02	1.2175E-02
35	1.21220	1.9631E-02	.384761	1.000000	2.6280E+00	7.6488E-02	1.2175E-02
36	1.21702	1.9715E-02	.363748	1.000000	2.5313E+00	7.6488E-02	1.2175E-02
37	1.22212	1.9798E-02	.341947	1.000000	2.4225E+00	7.6488E-02	1.2175E-02
38	1.22754	1.9882E-02	.319252	1.000000	2.3006E+00	7.6488E-02	1.2175E-02
39	1.23335	1.9966E-02	.295523	1.000000	2.1642E+00	7.6488E-02	1.2175E-02
40	1.23962	2.0050E-02	.270571	1.000000	2.0117E+00	7.6488E-02	1.2175E-02
41	1.24643	2.0134E-02	.244125	1.000000	1.8405E+00	7.6488E-02	1.2175E-02
42	1.25415	2.0218E-02	.215776	1.000000	1.6071E+00	7.6488E-02	1.2175E-02
43	1.26290	2.0301E-02	.184824	1.000000	1.4254E+00	7.6488E-02	1.2175E-02
44	1.27334	2.0385E-02	.149857	1.000000	1.1636E+00	7.6488E-02	1.2175E-02
45	1.28709	2.0469E-02	.106547	1.000000	8.2431E-01	7.6488E-02	1.2175E-02
46	1.31963	2.0553E-02	.034124	1.000000	1.9498E-01	7.6488E-02	1.2175E-02
47	2.59114	2.0637E-02	.000447	1.000000	2.9340E-03	7.6488E-02	1.2175E-02
48	3.41856	2.0721E-02	.000000	1.000000	.0	7.6488E-02	1.2175E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = .7000

	Y	PSI	UD	THD	FD	RHD	XLN
1	.00000	.0	1.199574	.792776	3.5047E-01	4.2187E-02	1.4370E-02
2	.16341	2.7320E-04	1.199767	.792550	3.5073E-01	4.2157E-02	1.4370E-02
3	.22843	5.4641E-04	1.200347	.791873	3.5149E-01	4.2067E-02	1.4370E-02
4	.28181	8.1961E-04	1.203181	.788562	3.5241E-01	4.1629E-02	1.4370E-02
5	.32407	1.0928E-03	1.203849	.781916	3.5318E-01	4.0757E-02	1.4370E-02
6	.36793	1.3660E-03	1.207062	.784006	3.5418E-01	4.1030E-02	1.4370E-02
7	.39345	1.6392E-03	1.216956	.772358	3.5458E-01	3.9523E-02	1.4370E-02
8	.44272	1.9124E-03	1.204896	.786554	3.5458E-01	4.1364E-02	1.4370E-02
9	.53153	2.8688E-03	1.175912	.820097	3.5436E-01	4.5907E-02	1.4370E-02
10	.60923	3.8252E-03	1.155497	.843234	3.5436E-01	4.9217E-02	1.4370E-02
11	.66859	4.7816E-03	1.101789	.902166	3.6500E-01	5.8274E-02	1.4370E-02
12	.71894	5.7380E-03	1.060051	.925221	3.6820E-01	6.2070E-02	1.4370E-02
13	.76506	6.6944E-03	1.084168	.920889	3.7165E-01	6.1347E-02	1.4370E-02
14	.80943	7.6508E-03	1.068343	.937447	3.7285E-01	6.4101E-02	1.4370E-02
15	.84905	8.6072E-03	1.052496	.953786	3.7292E-01	6.6973E-02	1.4370E-02
16	.88700	9.5636E-03	1.049374	.956975	3.7462E-01	6.7534E-02	1.4370E-02
17	.92257	1.0520E-02	1.041178	.965274	3.7646E-01	6.9002E-02	1.4370E-02
18	.95733	1.1476E-02	1.033089	.974238	3.7698E-01	7.0405E-02	1.4370E-02
19	.98915	1.2433E-02	1.026202	.979122	3.7855E-01	7.1366E-02	1.4370E-02
20	1.02148	1.3389E-02	1.013424	.986212	3.8041E-01	7.2025E-02	1.4370E-02
21	1.05058	1.4346E-02	.992405	.992489	3.8299E-01	7.3395E-02	1.4370E-02
22	1.08221	1.5302E-02	.947898	1.000569	3.8998E-01	7.4138E-02	1.4370E-02
23	1.11250	1.6258E-02	.873215	1.012596	4.2014E-01	7.4408E-02	1.4370E-02
24	1.15883	1.7435E-02	.772254	1.011860	5.4055E-01	7.5591E-02	1.4370E-02

25	1.17104	1.7826E-02	.693876	1.000000	2.5962E+00	7.6488E-02	1.4370E-02
26	1.19002	1.8347E-02	.620294	1.000000	2.7717E+00	7.6488E-02	1.4370E-02
27	1.20513	1.8735E-02	.561683	1.000000	2.8013E+00	7.6488E-02	1.4370E-02
28	1.21509	1.9044E-02	.523494	1.000000	2.7727E+00	7.6488E-02	1.4370E-02
29	1.21853	1.9129E-02	.510151	1.000000	2.7544E+00	7.6488E-02	1.4370E-02
30	1.22210	1.9211E-02	.496562	1.000000	2.7316E+00	7.6488E-02	1.4370E-02
31	1.22576	1.9295E-02	.482716	1.000000	2.7042E+00	7.6488E-02	1.4370E-02
32	1.22951	1.9370E-02	.468601	1.000000	2.6719E+00	7.6488E-02	1.4370E-02
33	1.23337	1.9463E-02	.454203	1.000000	2.6347E+00	7.6488E-02	1.4370E-02
34	1.23734	1.9547E-02	.439506	1.000000	2.5923E+00	7.6488E-02	1.4370E-02
35	1.24144	1.9631E-02	.424493	1.000000	2.5446E+00	7.6488E-02	1.4370E-02
36	1.24567	1.9715E-02	.409144	1.000000	2.4914E+00	7.6488E-02	1.4370E-02
37	1.25005	1.9799E-02	.393435	1.000000	2.4324E+00	7.6488E-02	1.4370E-02
38	1.25460	1.9882E-02	.377338	1.000000	2.3673E+00	7.6488E-02	1.4370E-02
39	1.25932	1.9966E-02	.360824	1.000000	2.2960E+00	7.6488E-02	1.4370E-02
40	1.26425	2.0050E-02	.343853	1.000000	2.2179E+00	7.6488E-02	1.4370E-02
41	1.26943	2.0134E-02	.326380	1.000000	2.1328E+00	7.6488E-02	1.4370E-02
42	1.27486	2.0218E-02	.308352	1.000000	2.0402E+00	7.6488E-02	1.4370E-02
43	1.28060	2.0301E-02	.289698	1.000000	1.9394E+00	7.6488E-02	1.4370E-02
44	1.28671	2.0385E-02	.270334	1.000000	1.8298E+00	7.6488E-02	1.4370E-02
45	1.29325	2.0469E-02	.250144	1.000000	1.7105E+00	7.6488E-02	1.4370E-02
46	1.30032	2.0553E-02	.228976	1.000000	1.5802E+00	7.6488E-02	1.4370E-02
47	1.30806	2.0637E-02	.206608	1.000000	1.4373E+00	7.6488E-02	1.4370E-02
48	1.31667	2.0721E-02	.182706	1.000000	1.2791E+00	7.6488E-02	1.4370E-02
49	1.32651	2.0805E-02	.156692	1.000000	1.1017E+00	7.6488E-02	1.4370E-02
50	1.33822	2.0888E-02	.127369	1.000000	8.9704E-01	7.6488E-02	1.4370E-02
51	1.35355	2.0972E-02	.091077	1.000000	6.3840E-01	7.6488E-02	1.4370E-02
52	1.38823	2.1056E-02	.030478	1.000000	1.7047E-01	7.6488E-02	1.4370E-02
53	2.65814	2.1140E-02	.000433	1.000000	2.9558E-03	7.6488E-02	1.4370E-02
54	3.49345	2.1224E-02	.000000	1.000000	.0	7.6488E-02	1.4370E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 1.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	1.315351	.650330	3.1105E-01	2.5767E-02	1.8027E-02
2	.20543	2.7320E-04	1.317823	.647166	3.1229E-01	2.5455E-02	1.8027E-02
3	.27675	5.4641E-04	1.231568	.754058	3.4727E-01	3.6924E-02	1.8027E-02
4	.32820	8.1961E-04	1.206488	.783780	3.5428E-01	4.0852E-02	1.8027E-02
5	.36047	1.0928E-03	1.160045	.837207	3.5025E-01	4.8252E-02	1.8027E-02
6	.39759	1.3660E-03	1.149818	.848689	3.4611E-01	4.9999E-02	1.8027E-02
7	.41394	1.6392E-03	1.143546	.855681	3.3640E-01	5.1062E-02	1.8027E-02
8	.45878	1.9124E-03	1.145872	.853093	3.3640E-01	5.0773E-02	1.8027E-02
9	.54722	2.8688E-03	1.121644	.879798	3.2533E-01	5.4840E-02	1.8027E-02
10	.60203	3.8252E-03	1.103272	.899668	3.2533E-01	5.7993E-02	1.8027E-02
11	.66447	4.7816E-03	1.089840	.913987	3.3006E-01	6.0330E-02	1.8027E-02
12	.71098	5.7380E-03	1.065083	.939920	3.3011E-01	6.4702E-02	1.8027E-02
13	.75827	6.6944E-03	1.069340	.935504	3.2788E-01	6.3946E-02	1.8027E-02
14	.80064	7.6508E-03	1.048172	.957293	3.2854E-01	6.7734E-02	1.8027E-02
15	.84017	8.6072E-03	1.047466	.957998	3.2683E-01	6.7857E-02	1.8027E-02
16	.87829	9.5636E-03	1.037666	.967834	3.2774E-01	6.9605E-02	1.8027E-02
17	.91344	1.0520E-02	1.031338	.973748	3.2757E-01	7.0643E-02	1.8027E-02
18	.94833	1.1476E-02	1.023609	.979697	3.2815E-01	7.1627E-02	1.8027E-02
19	.98030	1.2433E-02	1.010896	.986293	3.2932E-01	7.2611E-02	1.8027E-02
20	1.01318	1.3389E-02	.988843	.991937	3.3217E-01	7.3349E-02	1.8027E-02
21	1.04352	1.4346E-02	.950139	.998282	3.4181E-01	7.4020E-02	1.8027E-02
22	1.07804	1.5302E-02	.891654	1.007184	3.7530E-01	7.4358E-02	1.8027E-02
23	1.11053	1.6258E-02	.819046	1.016443	4.7509E-01	7.4484E-02	1.8027E-02
24	1.15995	1.7435E-02	.730282	1.014466	6.8091E-01	7.5397E-02	1.8027E-02

25	1.17277	1.7826E-02	.663708	1.000000	2.4386E+00	7.6488E-02	1.8027E-02
26	1.19238	1.8387E-02	.604380	1.000000	2.5325E+00	7.6488E-02	1.8027E-02
27	1.20770	1.8795E-02	.558276	1.000000	2.5436E+00	7.6488E-02	1.8027E-02
28	1.21757	1.9044E-02	.528790	1.000000	2.5243E+00	7.6488E-02	1.8027E-02
29	1.22100	1.9128E-02	.518595	1.000000	2.5131E+00	7.6488E-02	1.8027E-02
30	1.22449	1.9211E-02	.508268	1.000000	2.4995E+00	7.6488E-02	1.8027E-02
31	1.22805	1.9295E-02	.497805	1.000000	2.4835E+00	7.6488E-02	1.8027E-02
32	1.23167	1.9379E-02	.487203	1.000000	2.4649E+00	7.6488E-02	1.8027E-02
33	1.23536	1.9463E-02	.476455	1.000000	2.4437E+00	7.6488E-02	1.8027E-02
34	1.23912	1.9547E-02	.465558	1.000000	2.4199E+00	7.6488E-02	1.8027E-02
35	1.24296	1.9631E-02	.454504	1.000000	2.3935E+00	7.6488E-02	1.8027E-02
36	1.24688	1.9715E-02	.443289	1.000000	2.3642E+00	7.6488E-02	1.8027E-02
37	1.25090	1.9798E-02	.431905	1.000000	2.3322E+00	7.6488E-02	1.8027E-02
38	1.25500	1.9882E-02	.420345	1.000000	2.2974E+00	7.6488E-02	1.8027E-02
39	1.25921	1.9966E-02	.408600	1.000000	2.2595E+00	7.6488E-02	1.8027E-02
40	1.26353	2.0050E-02	.396661	1.000000	2.2187E+00	7.6488E-02	1.8027E-02
41	1.26797	2.0134E-02	.384517	1.000000	2.1747E+00	7.6488E-02	1.8027E-02
42	1.27253	2.0218E-02	.372157	1.000000	2.1275E+00	7.6488E-02	1.8027E-02
43	1.27723	2.0301E-02	.359567	1.000000	2.0770E+00	7.6488E-02	1.8027E-02
44	1.28208	2.0385E-02	.346733	1.000000	2.0231E+00	7.6488E-02	1.8027E-02
45	1.28710	2.0469E-02	.333636	1.000000	1.9656E+00	7.6488E-02	1.8027E-02
46	1.29230	2.0553E-02	.320258	1.000000	1.9044E+00	7.6488E-02	1.8027E-02
47	1.29771	2.0637E-02	.306574	1.000000	1.8394E+00	7.6488E-02	1.8027E-02
48	1.30334	2.0721E-02	.292558	1.000000	1.7703E+00	7.6488E-02	1.8027E-02
49	1.30922	2.0805E-02	.278176	1.000000	1.6969E+00	7.6488E-02	1.8027E-02
50	1.31540	2.0888E-02	.263388	1.000000	1.6190E+00	7.6488E-02	1.8027E-02
51	1.32190	2.0972E-02	.248147	1.000000	1.5362E+00	7.6488E-02	1.8027E-02
52	1.32879	2.1056E-02	.232391	1.000000	1.4481E+00	7.6488E-02	1.8027E-02
53	1.33614	2.1140E-02	.216042	1.000000	1.3543E+00	7.6488E-02	1.8027E-02

54	1.34404	2.1224E-02	.198995	1.000000	1.2539E+00	7.6488E-02	1.8027E-02
55	1.35261	2.1308E-02	.181107	1.000000	1.1462E+00	7.6488E-02	1.8027E-02
56	1.36205	2.1391E-02	.162167	1.000000	1.0298E+00	7.6488E-02	1.8027E-02
57	1.37265	2.1475E-02	.141847	1.000000	9.0247E-01	7.6488E-02	1.8027E-02
58	1.38490	2.1559E-02	.119559	1.000000	7.6030E-01	7.6488E-02	1.8027E-02
59	1.39987	2.1643E-02	.093919	1.000000	5.9353E-01	7.6488E-02	1.8027E-02
60	1.42143	2.1727E-02	.058463	1.000000	3.4895E-01	7.6488E-02	1.8027E-02
61	1.54399	2.1811E-02	.006726	1.000000	4.0471E-02	7.6488E-02	1.8027E-02
62	1.65752	2.1894E-02	.000000	1.000000	.0	7.6488E-02	1.8027E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 2.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
2	.03448	2.2737E-05	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
3	.06897	9.0949E-05	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
4	.10345	2.0463E-04	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
5	.13793	3.6379E-04	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
6	.17241	5.6843E-04	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
7	.20690	8.1854E-04	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
8	.24138	1.1141E-03	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
9	.27586	1.4552E-03	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
10	.31034	1.8417E-03	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
11	.34483	2.2737E-03	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
12	.37931	2.7512E-03	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
13	.41379	3.2742E-03	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
14	.44828	3.8426E-03	1.000000	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
15	.48276	4.4565E-03	.999990	1.000000	2.6595E-01	7.6488E-02	2.9586E-02
16	.51724	5.1159E-03	.999958	1.000000	2.6596E-01	7.6488E-02	2.9586E-02
17	.53356	5.4438E-03	.999921	1.000000	2.6597E-01	7.6488E-02	2.9586E-02
18	.54940	5.7717E-03	.999861	1.000000	2.6599E-01	7.6488E-02	2.9586E-02
19	.56480	6.0997E-03	.999766	1.000000	2.6604E-01	7.6488E-02	2.9586E-02
20	.57978	6.4276E-03	.999617	1.000000	2.6613E-01	7.6488E-02	2.9586E-02
21	.59440	6.7555E-03	.999389	1.000000	2.6631E-01	7.6488E-02	2.9586E-02
22	.60866	7.0835E-03	.999045	1.000000	2.6667E-01	7.6488E-02	2.9586E-02
23	.62261	7.4114E-03	.998536	1.000000	2.6735E-01	7.6488E-02	2.9586E-02
24	.63626	7.7393E-03	.997797	1.000000	2.6857E-01	7.6488E-02	2.9586E-02
25	.64963	8.0673E-03	.996741	1.000000	2.7074E-01	7.6488E-02	2.9586E-02
26	.66275	8.3952E-03	.995260	1.000000	2.7446E-01	7.6488E-02	2.9586E-02
27	.67564	8.7231E-03	.993219	1.000000	2.8065E-01	7.6488E-02	2.9586E-02
28	.68831	9.0510E-03	.990465	1.000000	2.9062E-01	7.6488E-02	2.9586E-02
29	.70080	9.3790E-03	.986833	1.000000	3.0603E-01	7.6488E-02	2.9586E-02
30	.71312	9.7069E-03	.982170	1.000000	3.2886E-01	7.6488E-02	2.9586E-02
31	.72530	1.0035E-02	.976356	1.000000	3.6108E-01	7.6488E-02	2.9586E-02
32	.73735	1.0363E-02	.969326	1.000000	4.0433E-01	7.6488E-02	2.9586E-02
33	.74930	1.0691E-02	.961085	1.000000	4.5950E-01	7.6488E-02	2.9586E-02
34	.76117	1.1019E-02	.951688	1.000000	5.2662E-01	7.6488E-02	2.9586E-02
35	.77298	1.1347E-02	.941228	1.000000	6.0491E-01	7.6488E-02	2.9586E-02
36	.78475	1.1675E-02	.929808	1.000000	6.9297E-01	7.6488E-02	2.9586E-02
37	.79649	1.2002E-02	.917530	1.000000	7.8908E-01	7.6488E-02	2.9586E-02
38	.80823	1.2330E-02	.904482	1.000000	8.9137E-01	7.6488E-02	2.9586E-02
39	.81996	1.2658E-02	.890743	1.000000	9.9799E-01	7.6488E-02	2.9586E-02
40	.83171	1.2986E-02	.876375	1.000000	1.1072E+00	7.6488E-02	2.9586E-02
41	.84350	1.3314E-02	.861429	1.000000	1.2173E+00	7.6488E-02	2.9586E-02
42	.85532	1.3642E-02	.845948	1.000000	1.3270E+00	7.6488E-02	2.9586E-02
43	.86720	1.3970E-02	.829965	1.000000	1.4348E+00	7.6488E-02	2.9586E-02
44	.87916	1.4298E-02	.813506	1.000000	1.5396E+00	7.6488E-02	2.9586E-02
45	.89119	1.4626E-02	.796593	1.000000	1.6404E+00	7.6488E-02	2.9586E-02
46	.90332	1.4954E-02	.779243	1.000000	1.7363E+00	7.6488E-02	2.9586E-02
47	.91556	1.5282E-02	.761468	1.000000	1.8264E+00	7.6488E-02	2.9586E-02
48	.92793	1.5610E-02	.743277	1.000000	1.9101E+00	7.6488E-02	2.9586E-02
49	.94044	1.5938E-02	.724677	1.000000	1.9868E+00	7.6488E-02	2.9586E-02
50	.95310	1.6266E-02	.705672	1.000000	2.0558E+00	7.6488E-02	2.9586E-02
51	.96594	1.6593E-02	.686261	1.000000	2.1168E+00	7.6488E-02	2.9586E-02
52	.97898	1.6921E-02	.666444	1.000000	2.1692E+00	7.6488E-02	2.9586E-02
53	.99224	1.7249E-02	.646216	1.000000	2.2128E+00	7.6488E-02	2.9586E-02
54	1.00574	1.7577E-02	.625571	1.000000	2.2470E+00	7.6488E-02	2.9586E-02
55	1.01952	1.7905E-02	.604501	1.000000	2.2716E+00	7.6488E-02	2.9586E-02

56	1.03359	1.8233E-02	.582992	1.000000	2.2864E+00	7.6488E-02	2.9586E-02
57	1.04800	1.8561E-02	.561030	1.000000	2.2910E+00	7.6488E-02	2.9586E-02
58	1.06278	1.8889E-02	.538596	1.000000	2.2851E+00	7.6488E-02	2.9586E-02
59	1.07799	1.9217E-02	.515666	1.000000	2.2685E+00	7.6488E-02	2.9586E-02
60	1.09366	1.9545E-02	.492214	1.000000	2.2408E+00	7.6488E-02	2.9586E-02
61	1.10988	1.9873E-02	.468205	1.000000	2.2018E+00	7.6488E-02	2.9586E-02
62	1.12671	2.0201E-02	.443598	1.000000	2.1511E+00	7.6488E-02	2.9586E-02
63	1.14425	2.0529E-02	.418343	1.000000	2.0884E+00	7.6488E-02	2.9586E-02
64	1.16261	2.0857E-02	.392375	1.000000	2.0132E+00	7.6488E-02	2.9586E-02
65	1.18193	2.1185E-02	.365615	1.000000	1.9249E+00	7.6488E-02	2.9586E-02
66	1.20241	2.1512E-02	.337958	1.000000	1.8228E+00	7.6488E-02	2.9586E-02
67	1.22429	2.1840E-02	.309266	1.000000	1.7061E+00	7.6488E-02	2.9586E-02
68	1.24792	2.2168E-02	.279346	1.000000	1.5734E+00	7.6488E-02	2.9586E-02
69	1.27381	2.2496E-02	.247918	1.000000	1.4231E+00	7.6488E-02	2.9586E-02
70	1.30275	2.2824E-02	.214552	1.000000	1.2520E+00	7.6488E-02	2.9586E-02
71	1.33609	2.3152E-02	.178508	1.000000	1.0544E+00	7.6488E-02	2.9586E-02
72	1.37666	2.3480E-02	.138265	1.000000	8.1626E-01	7.6488E-02	2.9586E-02
73	1.43350	2.3808E-02	.087764	1.000000	4.7047E-01	7.6488E-02	2.9586E-02
74	1.67455	2.4136E-02	.013161	1.000000	4.3376E-02	7.6488E-02	2.9586E-02
75	16.95213	2.4464E-02	.000030	1.000000	1.0431E-04	7.6488E-02	2.9586E-02
76	23.91538	2.4792E-02	.000000	1.000000	.0	7.6488E-02	2.9586E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 2.5000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
2	.03448	2.2737E-05	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
3	.06897	9.0949E-05	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
4	.10345	2.0463E-04	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
5	.13793	3.6379E-04	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
6	.17241	5.6843E-04	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
7	.20690	8.1854E-04	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
8	.24138	1.1141E-03	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
9	.27586	1.4552E-03	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
10	.31034	1.8417E-03	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
11	.34483	2.2737E-03	1.000000	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
12	.37931	2.7512E-03	.999996	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
13	.41379	3.2742E-03	.999980	1.000000	2.3939E-01	7.6488E-02	3.4423E-02
14	.44828	3.8426E-03	.999937	1.000000	2.3940E-01	7.6488E-02	3.4423E-02
15	.48276	4.4565E-03	.999821	1.000000	2.3944E-01	7.6488E-02	3.4423E-02
16	.51726	5.1159E-03	.999521	1.000000	2.3960E-01	7.6488E-02	3.4423E-02
17	.53359	5.4438E-03	.999228	1.000000	2.3984E-01	7.6488E-02	3.4423E-02
18	.54944	5.7717E-03	.998798	1.000000	2.4031E-01	7.6488E-02	3.4423E-02
19	.56485	6.0997E-03	.998173	1.000000	2.4118E-01	7.6488E-02	3.4423E-02
20	.57987	6.4276E-03	.997283	1.000000	2.4274E-01	7.6488E-02	3.4423E-02
21	.59452	6.7555E-03	.996037	1.000000	2.4547E-01	7.6488E-02	3.4423E-02
22	.60884	7.0835E-03	.994325	1.000000	2.5006E-01	7.6488E-02	3.4423E-02
23	.62286	7.4114E-03	.992022	1.000000	2.5752E-01	7.6488E-02	3.4423E-02
24	.63661	7.7393E-03	.988994	1.000000	2.6914E-01	7.6488E-02	3.4423E-02
25	.65011	8.0673E-03	.985110	1.000000	2.8649E-01	7.6488E-02	3.4423E-02
26	.66340	8.3952E-03	.980268	1.000000	3.1119E-01	7.6488E-02	3.4423E-02
27	.67649	8.7231E-03	.974407	1.000000	3.4466E-01	7.6488E-02	3.4423E-02
28	.68942	9.0510E-03	.967522	1.000000	3.8784E-01	7.6488E-02	3.4423E-02
29	.70221	9.3790E-03	.959655	1.000000	4.4101E-01	7.6488E-02	3.4423E-02
30	.71488	9.7069E-03	.950882	1.000000	5.0375E-01	7.6488E-02	3.4423E-02
31	.72745	1.0035E-02	.941294	1.000000	5.7515E-01	7.6488E-02	3.4423E-02
32	.73993	1.0363E-02	.930983	1.000000	6.5398E-01	7.6488E-02	3.4423E-02
33	.75235	1.0691E-02	.920031	1.000000	7.3883E-01	7.6488E-02	3.4423E-02
34	.76472	1.1019E-02	.908513	1.000000	8.2829E-01	7.6488E-02	3.4423E-02
35	.77704	1.1347E-02	.896488	1.000000	9.2100E-01	7.6488E-02	3.4423E-02
36	.78934	1.1675E-02	.884008	1.000000	1.0157E+00	7.6488E-02	3.4423E-02
37	.80162	1.2002E-02	.871112	1.000000	1.1112E+00	7.6488E-02	3.4423E-02
38	.81390	1.2330E-02	.857836	1.000000	1.2066E+00	7.6488E-02	3.4423E-02
39	.82619	1.2658E-02	.844207	1.000000	1.3009E+00	7.6488E-02	3.4423E-02
40	.83850	1.2986E-02	.830249	1.000000	1.3932E+00	7.6488E-02	3.4423E-02
41	.85083	1.3314E-02	.815979	1.000000	1.4830E+00	7.6488E-02	3.4423E-02
42	.86320	1.3642E-02	.801413	1.000000	1.5695E+00	7.6488E-02	3.4423E-02
43	.87563	1.3970E-02	.786563	1.000000	1.6522E+00	7.6488E-02	3.4423E-02
44	.88811	1.4298E-02	.771441	1.000000	1.7307E+00	7.6488E-02	3.4423E-02
45	.90066	1.4626E-02	.756054	1.000000	1.8045E+00	7.6488E-02	3.4423E-02
46	.91330	1.4954E-02	.740408	1.000000	1.8732E+00	7.6488E-02	3.4423E-02
47	.92603	1.5282E-02	.724510	1.000000	1.9366E+00	7.6488E-02	3.4423E-02
48	.93887	1.5610E-02	.708361	1.000000	1.9943E+00	7.6488E-02	3.4423E-02
49	.95183	1.5938E-02	.691965	1.000000	2.0462E+00	7.6488E-02	3.4423E-02
50	.96492	1.6266E-02	.675322	1.000000	2.0919E+00	7.6488E-02	3.4423E-02
51	.97815	1.6593E-02	.658433	1.000000	2.1313E+00	7.6488E-02	3.4423E-02
52	.99155	1.6921E-02	.641295	1.000000	2.1642E+00	7.6488E-02	3.4423E-02
53	1.00513	1.7249E-02	.623908	1.000000	2.1905E+00	7.6488E-02	3.4423E-02
54	1.01891	1.7577E-02	.606266	1.000000	2.2101E+00	7.6488E-02	3.4423E-02
55	1.03291	1.7905E-02	.588366	1.000000	2.2227E+00	7.6488E-02	3.4423E-02
56	1.04714	1.8233E-02	.570201	1.000000	2.2284E+00	7.6488E-02	3.4423E-02

57	1.06164	1.8561E-02	.551764	1.000000	2.2269E+00	7.6488E-02	3.4423E-02
58	1.07644	1.8889E-02	.533045	1.000000	2.2182E+00	7.6488E-02	3.4423E-02
59	1.09155	1.9217E-02	.514033	1.000000	2.2022E+00	7.6488E-02	3.4423E-02
60	1.10702	1.9545E-02	.494715	1.000000	2.1788E+00	7.6488E-02	3.4423E-02
61	1.12289	1.9873E-02	.475076	1.000000	2.1479E+00	7.6488E-02	3.4423E-02
62	1.13920	2.0201E-02	.455097	1.000000	2.1093E+00	7.6488E-02	3.4423E-02
63	1.15600	2.0529E-02	.434756	1.000000	2.0630E+00	7.6488E-02	3.4423E-02
64	1.17336	2.0857E-02	.414025	1.000000	2.0089E+00	7.6488E-02	3.4423E-02
65	1.19134	2.1185E-02	.392875	1.000000	1.9466E+00	7.6488E-02	3.4423E-02
66	1.21005	2.1512E-02	.371264	1.000000	1.8762E+00	7.6488E-02	3.4423E-02
67	1.22959	2.1840E-02	.349147	1.000000	1.7973E+00	7.6488E-02	3.4423E-02
68	1.25008	2.2168E-02	.326463	1.000000	1.7096E+00	7.6488E-02	3.4423E-02
69	1.27171	2.2496E-02	.303135	1.000000	1.6129E+00	7.6488E-02	3.4423E-02
70	1.29471	2.2824E-02	.279065	1.000000	1.5065E+00	7.6488E-02	3.4423E-02
71	1.31937	2.3152E-02	.254117	1.000000	1.3899E+00	7.6488E-02	3.4423E-02
72	1.34613	2.3480E-02	.228099	1.000000	1.2620E+00	7.6488E-02	3.4423E-02
73	1.37564	2.3808E-02	.200722	1.000000	1.1214E+00	7.6488E-02	3.4423E-02
74	1.40894	2.4136E-02	.171509	1.000000	9.6556E-01	7.6488E-02	3.4423E-02
75	1.44794	2.4464E-02	.139552	1.000000	7.8957E-01	7.6488E-02	3.4423E-02
76	1.49717	2.4792E-02	.102638	1.000000	5.7853E-01	7.6488E-02	3.4423E-02
77	1.58018	2.5120E-02	.049881	1.000000	2.1249E-01	7.6488E-02	3.4423E-02
78	2.50378	2.5448E-02	.002382	1.000000	8.2900E-03	7.6488E-02	3.4423E-02
79	3.16873	2.5776E-02	.000000	1.000000	.0	7.6488E-02	3.4423E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 3.4000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	1.000000	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
2	.03448	2.2737E-05	1.000000	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
3	.06897	9.0949E-05	1.000000	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
4	.10345	2.0463E-04	1.000000	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
5	.13793	3.6379E-04	1.000000	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
6	.17241	5.6843E-04	1.000000	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
7	.20690	8.1854E-04	.999998	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
8	.24138	1.1141E-03	.999989	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
9	.27586	1.4552E-03	.999969	1.000000	2.0701E-01	7.6488E-02	4.4166E-02
10	.31035	1.8417E-03	.999924	1.000000	2.0702E-01	7.6488E-02	4.4166E-02
11	.34264	2.2448E-03	.999831	1.000000	2.0705E-01	7.6488E-02	4.4166E-02
12	.37214	2.6479E-03	.999657	1.000000	2.0713E-01	7.6488E-02	4.4166E-02
13	.39947	3.0510E-03	.999352	1.000000	2.0734E-01	7.6488E-02	4.4166E-02
14	.42506	3.4542E-03	.998843	1.000000	2.0784E-01	7.6488E-02	4.4166E-02
15	.44921	3.8573E-03	.998026	1.000000	2.0896E-01	7.6488E-02	4.4166E-02
16	.47215	4.2604E-03	.996766	1.000000	2.1130E-01	7.6488E-02	4.4166E-02
17	.49406	4.6635E-03	.994890	1.000000	2.1587E-01	7.6488E-02	4.4166E-02
18	.51509	5.0666E-03	.992197	1.000000	2.2419E-01	7.6488E-02	4.4166E-02
19	.53535	5.4697E-03	.988476	1.000000	2.3837E-01	7.6488E-02	4.4166E-02
20	.55496	5.8728E-03	.983547	1.000000	2.6086E-01	7.6488E-02	4.4166E-02
21	.57401	6.2759E-03	.977306	1.000000	2.9396E-01	7.6488E-02	4.4166E-02
22	.59257	6.6790E-03	.969755	1.000000	3.3915E-01	7.6488E-02	4.4166E-02
23	.61072	7.0821E-03	.960990	1.000000	3.9672E-01	7.6488E-02	4.4166E-02
24	.62851	7.4853E-03	.951165	1.000000	4.6578E-01	7.6488E-02	4.4166E-02
25	.64600	7.8884E-03	.940443	1.000000	5.4465E-01	7.6488E-02	4.4166E-02
26	.66323	8.2915E-03	.928976	1.000000	6.3131E-01	7.6488E-02	4.4166E-02
27	.68023	8.6946E-03	.916888	1.000000	7.2373E-01	7.6488E-02	4.4166E-02
28	.69704	9.0977E-03	.904280	1.000000	8.1998E-01	7.6488E-02	4.4166E-02
29	.71369	9.5008E-03	.891232	1.000000	9.1840E-01	7.6488E-02	4.4166E-02
30	.73019	9.9039E-03	.877803	1.000000	1.0175E+00	7.6488E-02	4.4166E-02
31	.74659	1.0307E-02	.864044	1.000000	1.1161E+00	7.6488E-02	4.4166E-02
32	.76288	1.0710E-02	.849990	1.000000	1.2130E+00	7.6488E-02	4.4166E-02
33	.77910	1.1113E-02	.835672	1.000000	1.3075E+00	7.6488E-02	4.4166E-02
34	.79527	1.1516E-02	.821115	1.000000	1.3988E+00	7.6488E-02	4.4166E-02
35	.81140	1.1919E-02	.806337	1.000000	1.4863E+00	7.6488E-02	4.4166E-02
36	.82750	1.2323E-02	.791354	1.000000	1.5695E+00	7.6488E-02	4.4166E-02
37	.84360	1.2726E-02	.776178	1.000000	1.6480E+00	7.6488E-02	4.4166E-02
38	.85970	1.3129E-02	.760819	1.000000	1.7214E+00	7.6488E-02	4.4166E-02
39	.87583	1.3532E-02	.745285	1.000000	1.7895E+00	7.6488E-02	4.4166E-02
40	.89201	1.3935E-02	.729583	1.000000	1.8521E+00	7.6488E-02	4.4166E-02
41	.90823	1.4338E-02	.713716	1.000000	1.9089E+00	7.6488E-02	4.4166E-02
42	.92454	1.4741E-02	.697689	1.000000	1.9598E+00	7.6488E-02	4.4166E-02
43	.94093	1.5144E-02	.681504	1.000000	2.0048E+00	7.6488E-02	4.4166E-02
44	.95742	1.5547E-02	.665162	1.000000	2.0437E+00	7.6488E-02	4.4166E-02
45	.97404	1.5951E-02	.648664	1.000000	2.0765E+00	7.6488E-02	4.4166E-02
46	.99080	1.6354E-02	.632009	1.000000	2.1031E+00	7.6488E-02	4.4166E-02
47	1.00771	1.6757E-02	.615195	1.000000	2.1234E+00	7.6488E-02	4.4166E-02
48	1.02481	1.7160E-02	.598220	1.000000	2.1376E+00	7.6488E-02	4.4166E-02
49	1.04211	1.7563E-02	.581082	1.000000	2.1455E+00	7.6488E-02	4.4166E-02
50	1.05964	1.7966E-02	.563775	1.000000	2.1471E+00	7.6488E-02	4.4166E-02
51	1.07742	1.8369E-02	.546295	1.000000	2.1425E+00	7.6488E-02	4.4166E-02
52	1.09547	1.8772E-02	.528636	1.000000	2.1316E+00	7.6488E-02	4.4166E-02
53	1.11384	1.9175E-02	.510790	1.000000	2.1145E+00	7.6488E-02	4.4166E-02
54	1.13255	1.9579E-02	.492748	1.000000	2.0912E+00	7.6488E-02	4.4166E-02
55	1.15164	1.9982E-02	.474501	1.000000	2.0616E+00	7.6488E-02	4.4166E-02
56	1.17115	2.0385E-02	.456035	1.000000	2.0259E+00	7.6488E-02	4.4166E-02

57	1.19114	2.0788E-02	.437339	1.000000	1.9839E+00	7.6488E-02	4.4166E-02
58	1.21165	2.1191E-02	.418394	1.000000	1.9356E+00	7.6488E-02	4.4166E-02
59	1.23276	2.1594E-02	.399182	1.000000	1.8811E+00	7.6488E-02	4.4166E-02
60	1.25454	2.1997E-02	.379679	1.000000	1.8204E+00	7.6488E-02	4.4166E-02
61	1.27708	2.2400E-02	.359858	1.000000	1.7532E+00	7.6488E-02	4.4166E-02
62	1.30048	2.2803E-02	.339686	1.000000	1.6797E+00	7.6488E-02	4.4166E-02
63	1.32488	2.3207E-02	.319121	1.000000	1.5997E+00	7.6488E-02	4.4166E-02
64	1.35044	2.3610E-02	.298114	1.000000	1.5130E+00	7.6488E-02	4.4166E-02
65	1.37737	2.4013E-02	.276598	1.000000	1.4195E+00	7.6488E-02	4.4166E-02
66	1.40595	2.4416E-02	.254489	1.000000	1.3187E+00	7.6488E-02	4.4166E-02
67	1.43652	2.4819E-02	.231674	1.000000	1.2105E+00	7.6488E-02	4.4166E-02
68	1.46962	2.5222E-02	.207992	1.000000	1.0940E+00	7.6488E-02	4.4166E-02
69	1.50598	2.5625E-02	.183201	1.000000	9.6828E-01	7.6488E-02	4.4166E-02
70	1.54683	2.6028E-02	.156912	1.000000	8.3159E-01	7.6488E-02	4.4166E-02
71	1.59435	2.6431E-02	.128407	1.000000	6.8017E-01	7.6488E-02	4.4166E-02
72	1.65342	2.6835E-02	.096031	1.000000	5.0281E-01	7.6488E-02	4.4166E-02
73	1.74504	2.7238E-02	.052284	1.000000	2.2152E-01	7.6488E-02	4.4166E-02
74	2.44276	2.7641E-02	.003875	1.000000	1.3048E-02	7.6488E-02	4.4166E-02
75	2.98144	2.8044E-02	.000000	1.000000	.0	7.6488E-02	4.4166E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 4.1287

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.999999	1.000000	1.8886E-01	7.6488E-02	5.2055E-02
2	.03448	2.2737E-05	.999999	1.000000	1.8886E-01	7.6488E-02	5.2055E-02
3	.06897	9.0949E-05	.999998	1.000000	1.8886E-01	7.6488E-02	5.2055E-02
4	.10345	2.0463E-04	.999991	1.000000	1.8886E-01	7.6488E-02	5.2055E-02
5	.13793	3.6379E-04	.999977	1.000000	1.8886E-01	7.6488E-02	5.2055E-02
6	.17242	5.6843E-04	.999950	1.000000	1.8887E-01	7.6488E-02	5.2055E-02
7	.20690	8.1854E-04	.999894	1.000000	1.8888E-01	7.6488E-02	5.2055E-02
8	.24139	1.1141E-03	.999782	1.000000	1.8892E-01	7.6488E-02	5.2055E-02
9	.27588	1.4552E-03	.999559	1.000000	1.8903E-01	7.6488E-02	5.2055E-02
10	.31038	1.8417E-03	.999126	1.000000	1.8937E-01	7.6488E-02	5.2055E-02
11	.34270	2.2448E-03	.998363	1.000000	1.9026E-01	7.6488E-02	5.2055E-02
12	.37225	2.6479E-03	.997135	1.000000	1.9229E-01	7.6488E-02	5.2055E-02
13	.39967	3.0510E-03	.995256	1.000000	1.9651E-01	7.6488E-02	5.2055E-02
14	.42538	3.4542E-03	.992512	1.000000	2.0455E-01	7.6488E-02	5.2055E-02
15	.44970	3.8573E-03	.988690	1.000000	2.1862E-01	7.6488E-02	5.2055E-02
16	.47287	4.2604E-03	.983625	1.000000	2.4121E-01	7.6488E-02	5.2055E-02
17	.49508	4.6635E-03	.977249	1.000000	2.7449E-01	7.6488E-02	5.2055E-02
18	.51649	5.0666E-03	.969615	1.000000	3.1960E-01	7.6488E-02	5.2055E-02
19	.53722	5.4697E-03	.960868	1.000000	3.7639E-01	7.6488E-02	5.2055E-02
20	.55736	5.8728E-03	.951193	1.000000	4.4359E-01	7.6488E-02	5.2055E-02
21	.57701	6.2759E-03	.940771	1.000000	5.1931E-01	7.6488E-02	5.2055E-02
22	.59622	6.6790E-03	.929754	1.000000	6.0152E-01	7.6488E-02	5.2055E-02
23	.61506	7.0821E-03	.918266	1.000000	6.8828E-01	7.6488E-02	5.2055E-02
24	.63356	7.4853E-03	.906399	1.000000	7.7788E-01	7.6488E-02	5.2055E-02
25	.65178	7.8884E-03	.894225	1.000000	8.6886E-01	7.6488E-02	5.2055E-02
26	.66975	8.2915E-03	.881797	1.000000	9.6001E-01	7.6488E-02	5.2055E-02
27	.68749	8.6946E-03	.869158	1.000000	1.0503E+00	7.6488E-02	5.2055E-02
28	.70504	9.0977E-03	.856338	1.000000	1.1390E+00	7.6488E-02	5.2055E-02
29	.72242	9.5008E-03	.843364	1.000000	1.2253E+00	7.6488E-02	5.2055E-02
30	.73965	9.9039E-03	.830253	1.000000	1.3088E+00	7.6488E-02	5.2055E-02
31	.75675	1.0307E-02	.817021	1.000000	1.3890E+00	7.6488E-02	5.2055E-02
32	.77375	1.0710E-02	.803681	1.000000	1.4656E+00	7.6488E-02	5.2055E-02
33	.79066	1.1113E-02	.790242	1.000000	1.5383E+00	7.6488E-02	5.2055E-02
34	.80750	1.1516E-02	.776712	1.000000	1.6068E+00	7.6488E-02	5.2055E-02
35	.82428	1.1919E-02	.763096	1.000000	1.6711E+00	7.6488E-02	5.2055E-02
36	.84102	1.2323E-02	.749399	1.000000	1.7311E+00	7.6488E-02	5.2055E-02
37	.85774	1.2726E-02	.735626	1.000000	1.7865E+00	7.6488E-02	5.2055E-02
38	.87444	1.3129E-02	.721778	1.000000	1.8373E+00	7.6488E-02	5.2055E-02
39	.89114	1.3532E-02	.707859	1.000000	1.8836E+00	7.6488E-02	5.2055E-02
40	.90786	1.3935E-02	.693868	1.000000	1.9252E+00	7.6488E-02	5.2055E-02
41	.92462	1.4338E-02	.679808	1.000000	1.9622E+00	7.6488E-02	5.2055E-02
42	.94141	1.4741E-02	.665678	1.000000	1.9946E+00	7.6488E-02	5.2055E-02
43	.95826	1.5144E-02	.651478	1.000000	2.0223E+00	7.6488E-02	5.2055E-02
44	.97519	1.5547E-02	.637207	1.000000	2.0454E+00	7.6488E-02	5.2055E-02
45	.99220	1.5951E-02	.622865	1.000000	2.0640E+00	7.6488E-02	5.2055E-02
46	1.00931	1.6354E-02	.608450	1.000000	2.0780E+00	7.6488E-02	5.2055E-02
47	1.02653	1.6757E-02	.593960	1.000000	2.0875E+00	7.6488E-02	5.2055E-02
48	1.04389	1.7160E-02	.579393	1.000000	2.0926E+00	7.6488E-02	5.2055E-02
49	1.06140	1.7563E-02	.564746	1.000000	2.0932E+00	7.6488E-02	5.2055E-02
50	1.07907	1.7966E-02	.550017	1.000000	2.0895E+00	7.6488E-02	5.2055E-02
51	1.09693	1.8369E-02	.535201	1.000000	2.0814E+00	7.6488E-02	5.2055E-02
52	1.11499	1.8772E-02	.520295	1.000000	2.0690E+00	7.6488E-02	5.2055E-02
53	1.13328	1.9175E-02	.505295	1.000000	2.0524E+00	7.6488E-02	5.2055E-02

54	1.15182	1.9579E-02	.490195	1.000000	2.0316E+00	7.6488E-02	5.2055E-02
55	1.17063	1.9982E-02	.474990	1.000000	2.0065E+00	7.6488E-02	5.2055E-02
56	1.18975	2.0385E-02	.459673	1.000000	1.9774E+00	7.6488E-02	5.2055E-02
57	1.20920	2.0788E-02	.444237	1.000000	1.9442E+00	7.6488E-02	5.2055E-02
58	1.22901	2.1191E-02	.428675	1.000000	1.9069E+00	7.6488E-02	5.2055E-02
59	1.24923	2.1594E-02	.412976	1.000000	1.8656E+00	7.6488E-02	5.2055E-02
60	1.26990	2.1997E-02	.397131	1.000000	1.8202E+00	7.6488E-02	5.2055E-02
61	1.29106	2.2400E-02	.381128	1.000000	1.7709E+00	7.6488E-02	5.2055E-02
62	1.31278	2.2803E-02	.364953	1.000000	1.7176E+00	7.6488E-02	5.2055E-02
63	1.33510	2.3207E-02	.348590	1.000000	1.6603E+00	7.6488E-02	5.2055E-02
64	1.35812	2.3610E-02	.332020	1.000000	1.5990E+00	7.6488E-02	5.2055E-02
65	1.38191	2.4013E-02	.315222	1.000000	1.5337E+00	7.6488E-02	5.2055E-02
66	1.40658	2.4416E-02	.298170	1.000000	1.4643E+00	7.6488E-02	5.2055E-02
67	1.43225	2.4819E-02	.280832	1.000000	1.3908E+00	7.6488E-02	5.2055E-02
68	1.45909	2.5222E-02	.263170	1.000000	1.3131E+00	7.6488E-02	5.2055E-02
69	1.48727	2.5625E-02	.245135	1.000000	1.2311E+00	7.6488E-02	5.2055E-02
70	1.51706	2.6028E-02	.226665	1.000000	1.1445E+00	7.6488E-02	5.2055E-02
71	1.54879	2.6431E-02	.207681	1.000000	1.0531E+00	7.6488E-02	5.2055E-02
72	1.58289	2.6835E-02	.188073	1.000000	9.5639E-01	7.6488E-02	5.2055E-02
73	1.62001	2.7238E-02	.167685	1.000000	8.5374E-01	7.6488E-02	5.2055E-02
74	1.66113	2.7641E-02	.146280	1.000000	7.4402E-01	7.6488E-02	5.2055E-02
75	1.70786	2.8044E-02	.123460	1.000000	6.2522E-01	7.6488E-02	5.2055E-02
76	1.76331	2.8447E-02	.098414	1.000000	4.9318E-01	7.6488E-02	5.2055E-02
77	1.83583	2.8850E-02	.068484	1.000000	3.3349E-01	7.6488E-02	5.2055E-02
78	2.00417	2.9253E-02	.021402	1.000000	7.6999E-02	7.6488E-02	5.2055E-02
79	6.74684	2.9656E-02	.000257	1.000000	1.0257E-03	7.6488E-02	5.2055E-02
80	9.32861	3.0059E-02	.000000	1.000000	.0	7.6488E-02	5.2055E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 5.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.999805	1.000000	1.7417E-01	7.6488E-02	6.8294E-02
2	.03965	3.0059E-05	.999805	1.000000	1.7417E-01	7.6488E-02	6.8294E-02
3	.05692	6.1942E-05	.999782	1.000000	1.7418E-01	7.6488E-02	6.8294E-02
4	.07077	9.5758E-05	.999752	1.000000	1.7419E-01	7.6488E-02	6.8294E-02
5	.08298	1.3162E-04	.999716	1.000000	1.7420E-01	7.6488E-02	6.8294E-02
6	.09421	1.6967E-04	.999673	1.000000	1.7422E-01	7.6488E-02	6.8294E-02
7	.10481	2.1001E-04	.999624	1.000000	1.7425E-01	7.6488E-02	6.8294E-02
8	.11500	2.5281E-04	.999567	1.000000	1.7428E-01	7.6488E-02	6.8294E-02
9	.12490	2.9820E-04	.999501	1.000000	1.7432E-01	7.6488E-02	6.8294E-02
10	.13461	3.4635E-04	.999424	1.000000	1.7437E-01	7.6488E-02	6.8294E-02
11	.14419	3.9741E-04	.999336	1.000000	1.7443E-01	7.6488E-02	6.8294E-02
12	.15370	4.5157E-04	.999233	1.000000	1.7451E-01	7.6488E-02	6.8294E-02
13	.16319	5.0901E-04	.999113	1.000000	1.7461E-01	7.6488E-02	6.8294E-02
14	.17269	5.6994E-04	.998974	1.000000	1.7474E-01	7.6488E-02	6.8294E-02
15	.18222	6.3457E-04	.998812	1.000000	1.7491E-01	7.6488E-02	6.8294E-02
16	.19182	7.0311E-04	.998623	1.000000	1.7513E-01	7.6488E-02	6.8294E-02
17	.20150	7.7581E-04	.998400	1.000000	1.7541E-01	7.6488E-02	6.8294E-02
18	.21128	8.5292E-04	.998139	1.000000	1.7578E-01	7.6488E-02	6.8294E-02
19	.22119	9.3470E-04	.997831	1.000000	1.7625E-01	7.6488E-02	6.8294E-02
20	.23124	1.0214E-03	.997469	1.000000	1.7686E-01	7.6488E-02	6.8294E-02
21	.24145	1.1134E-03	.997040	1.000000	1.7765E-01	7.6488E-02	6.8294E-02
22	.25183	1.2110E-03	.996532	1.000000	1.7868E-01	7.6488E-02	6.8294E-02
23	.26239	1.3145E-03	.995929	1.000000	1.8002E-01	7.6488E-02	6.8294E-02
24	.27316	1.4243E-03	.995213	1.000000	1.8178E-01	7.6488E-02	6.8294E-02
25	.28415	1.5408E-03	.994361	1.000000	1.8407E-01	7.6488E-02	6.8294E-02
26	.29536	1.6642E-03	.993346	1.000000	1.8706E-01	7.6488E-02	6.8294E-02
27	.30682	1.7952E-03	.992137	1.000000	1.9096E-01	7.6488E-02	6.8294E-02
28	.31854	1.9342E-03	.990699	1.000000	1.9604E-01	7.6488E-02	6.8294E-02
29	.33053	2.0815E-03	.988988	1.000000	2.0262E-01	7.6488E-02	6.8294E-02
30	.34282	2.2378E-03	.986960	1.000000	2.1111E-01	7.6488E-02	6.8294E-02
31	.35541	2.4036E-03	.984565	1.000000	2.2198E-01	7.6488E-02	6.8294E-02
32	.36833	2.5794E-03	.981750	1.000000	2.3580E-01	7.6488E-02	6.8294E-02
33	.38160	2.7659E-03	.978463	1.000000	2.5316E-01	7.6488E-02	6.8294E-02
34	.39524	2.9637E-03	.974655	1.000000	2.7470E-01	7.6488E-02	6.8294E-02
35	.40926	3.1735E-03	.970284	1.000000	3.0103E-01	7.6488E-02	6.8294E-02
36	.42370	3.3960E-03	.965311	1.000000	3.3273E-01	7.6488E-02	6.8294E-02
37	.43857	3.6320E-03	.959708	1.000000	3.7026E-01	7.6488E-02	6.8294E-02
38	.45390	3.8823E-03	.953455	1.000000	4.1398E-01	7.6488E-02	6.8294E-02
39	.46973	4.1478E-03	.946536	1.000000	4.6410E-01	7.6488E-02	6.8294E-02
40	.48607	4.4294E-03	.938940	1.000000	5.2068E-01	7.6488E-02	6.8294E-02
41	.50297	4.7281E-03	.930656	1.000000	5.8367E-01	7.6488E-02	6.8294E-02
42	.52044	5.0449E-03	.921673	1.000000	6.5286E-01	7.6488E-02	6.8294E-02
43	.53854	5.3809E-03	.911981	1.000000	7.2795E-01	7.6488E-02	6.8294E-02
44	.55730	5.7373E-03	.901563	1.000000	8.0853E-01	7.6488E-02	6.8294E-02
45	.57676	6.1153E-03	.890403	1.000000	8.9411E-01	7.6488E-02	6.8294E-02
46	.59695	6.5162E-03	.878476	1.000000	9.8408E-01	7.6488E-02	6.8294E-02
47	.61794	6.9415E-03	.865759	1.000000	1.0778E+00	7.6488E-02	6.8294E-02
48	.63978	7.3925E-03	.852221	1.000000	1.1744E+00	7.6488E-02	6.8294E-02
49	.66251	7.8709E-03	.837828	1.000000	1.2732E+00	7.6488E-02	6.8294E-02
50	.68621	8.3782E-03	.822542	1.000000	1.3731E+00	7.6488E-02	6.8294E-02
51	.71095	8.9164E-03	.806319	1.000000	1.4732E+00	7.6488E-02	6.8294E-02
52	.73680	9.4872E-03	.789113	1.000000	1.5723E+00	7.6488E-02	6.8294E-02
53	.76385	1.0093E-02	.770869	1.000000	1.6693E+00	7.6488E-02	6.8294E-02
54	.79220	1.0735E-02	.751531	1.000000	1.7626E+00	7.6488E-02	6.8294E-02
55	.82198	1.1416E-02	.731033	1.000000	1.8510E+00	7.6488E-02	6.8294E-02

56	.85329	1.2138E-02	.709304	1.000000	1.9328E+00	7.6488E-02	6.8294E-02
57	.88631	1.2904E-02	.686266	1.000000	2.0064E+00	7.6488E-02	6.8294E-02
58	.92120	1.3717E-02	.661829	1.000000	2.0698E+00	7.6488E-02	6.8294E-02
59	.95818	1.4579E-02	.635896	1.000000	2.1211E+00	7.6488E-02	6.8294E-02
60	.99750	1.5493E-02	.608353	1.000000	2.1582E+00	7.6488E-02	6.8294E-02
61	1.03945	1.6463E-02	.579073	1.000000	2.1787E+00	7.6488E-02	6.8294E-02
62	1.08442	1.7491E-02	.547907	1.000000	2.1801E+00	7.6488E-02	6.8294E-02
63	1.13290	1.8582E-02	.514680	1.000000	2.1597E+00	7.6488E-02	6.8294E-02
64	1.18548	1.9739E-02	.479178	1.000000	2.1146E+00	7.6488E-02	6.8294E-02
65	1.24301	2.0966E-02	.441139	1.000000	2.0415E+00	7.6488E-02	6.8294E-02
66	1.30662	2.2268E-02	.400223	1.000000	1.9370E+00	7.6488E-02	6.8294E-02
67	1.37798	2.3648E-02	.355978	1.000000	1.7967E+00	7.6488E-02	6.8294E-02
68	1.45972	2.5112E-02	.307758	1.000000	1.6152E+00	7.6488E-02	6.8294E-02
69	1.55636	2.6665E-02	.254554	1.000000	1.3834E+00	7.6488E-02	6.8294E-02
70	1.67720	2.8312E-02	.194409	1.000000	1.0811E+00	7.6488E-02	6.8294E-02
71	1.85225	3.0059E-02	.119324	1.000000	5.9920E-01	7.6488E-02	6.8294E-02
72	2.60148	3.1912E-02	.016532	1.000000	4.3731E-02	7.6488E-02	6.8294E-02
73	30.44619	3.3878E-02	.000056	1.000000	1.4485E-04	7.6488E-02	6.8294E-02
74	43.62314	3.5962E-02	.000000	1.000000	.0	7.6488E-02	6.8294E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 6.2000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.995253	1.000000	1.6302E-01	7.6488E-02	7.7797E-02
2	.03974	3.0059E-05	.995253	1.000000	1.6302E-01	7.6488E-02	7.7797E-02
3	.05705	6.1942E-05	.994941	1.000000	1.6375E-01	7.6488E-02	7.7797E-02
4	.07094	9.5758E-05	.994536	1.000000	1.6473E-01	7.6488E-02	7.7797E-02
5	.08318	1.3162E-04	.994063	1.000000	1.6593E-01	7.6488E-02	7.7797E-02
6	.09445	1.6967E-04	.993526	1.000000	1.6737E-01	7.6488E-02	7.7797E-02
7	.10510	2.1001E-04	.992924	1.000000	1.6906E-01	7.6488E-02	7.7797E-02
8	.11533	2.5281E-04	.992251	1.000000	1.7105E-01	7.6488E-02	7.7797E-02
9	.12527	2.9820E-04	.991501	1.000000	1.7339E-01	7.6488E-02	7.7797E-02
10	.13503	3.4635E-04	.990668	1.000000	1.7613E-01	7.6488E-02	7.7797E-02
11	.14467	3.9741E-04	.989741	1.000000	1.7935E-01	7.6488E-02	7.7797E-02
12	.15425	4.5157E-04	.988712	1.000000	1.8311E-01	7.6488E-02	7.7797E-02
13	.16381	5.0901E-04	.987571	1.000000	1.8751E-01	7.6488E-02	7.7797E-02
14	.17339	5.6994E-04	.986304	1.000000	1.9265E-01	7.6488E-02	7.7797E-02
15	.18301	6.3457E-04	.984901	1.000000	1.9864E-01	7.6488E-02	7.7797E-02
16	.19270	7.0311E-04	.983348	1.000000	2.0561E-01	7.6488E-02	7.7797E-02
17	.20249	7.7581E-04	.981632	1.000000	2.1370E-01	7.6488E-02	7.7797E-02
18	.21240	8.5292E-04	.979739	1.000000	2.2305E-01	7.6488E-02	7.7797E-02
19	.22245	9.3470E-04	.977654	1.000000	2.3383E-01	7.6488E-02	7.7797E-02
20	.23266	1.0214E-03	.975365	1.000000	2.4620E-01	7.6488E-02	7.7797E-02
21	.24304	1.1134E-03	.972858	1.000000	2.6033E-01	7.6488E-02	7.7797E-02
22	.25362	1.2110E-03	.970119	1.000000	2.7640E-01	7.6488E-02	7.7797E-02
23	.26441	1.3145E-03	.967138	1.000000	2.9455E-01	7.6488E-02	7.7797E-02
24	.27542	1.4243E-03	.963902	1.000000	3.1497E-01	7.6488E-02	7.7797E-02
25	.28668	1.5408E-03	.960402	1.000000	3.3778E-01	7.6488E-02	7.7797E-02
26	.29820	1.6642E-03	.956628	1.000000	3.6313E-01	7.6488E-02	7.7797E-02
27	.31000	1.7952E-03	.952571	1.000000	3.9113E-01	7.6488E-02	7.7797E-02
28	.32209	1.9342E-03	.948223	1.000000	4.2187E-01	7.6488E-02	7.7797E-02
29	.33450	2.0815E-03	.943577	1.000000	4.5542E-01	7.6488E-02	7.7797E-02
30	.34724	2.2378E-03	.938624	1.000000	4.9184E-01	7.6488E-02	7.7797E-02
31	.36033	2.4036E-03	.933358	1.000000	5.3116E-01	7.6488E-02	7.7797E-02
32	.37379	2.5794E-03	.927769	1.000000	5.7338E-01	7.6488E-02	7.7797E-02
33	.38764	2.7659E-03	.921850	1.000000	6.1849E-01	7.6488E-02	7.7797E-02
34	.40190	2.9637E-03	.915591	1.000000	6.6645E-01	7.6488E-02	7.7797E-02
35	.41659	3.1735E-03	.908982	1.000000	7.1721E-01	7.6488E-02	7.7797E-02
36	.43174	3.3960E-03	.902013	1.000000	7.7069E-01	7.6488E-02	7.7797E-02
37	.44737	3.6320E-03	.894672	1.000000	8.2677E-01	7.6488E-02	7.7797E-02
38	.46351	3.8823E-03	.886945	1.000000	8.8533E-01	7.6488E-02	7.7797E-02
39	.48017	4.1478E-03	.878819	1.000000	9.4623E-01	7.6488E-02	7.7797E-02
40	.49740	4.4294E-03	.870279	1.000000	1.0093E+00	7.6488E-02	7.7797E-02
41	.51521	4.7281E-03	.861308	1.000000	1.0743E+00	7.6488E-02	7.7797E-02
42	.53365	5.0449E-03	.851888	1.000000	1.1410E+00	7.6488E-02	7.7797E-02
43	.55275	5.3809E-03	.842001	1.000000	1.2092E+00	7.6488E-02	7.7797E-02
44	.57254	5.7373E-03	.831625	1.000000	1.2785E+00	7.6488E-02	7.7797E-02
45	.59307	6.1153E-03	.820738	1.000000	1.3486E+00	7.6488E-02	7.7797E-02
46	.61438	6.5162E-03	.809316	1.000000	1.4192E+00	7.6488E-02	7.7797E-02
47	.63651	6.9415E-03	.797335	1.000000	1.4899E+00	7.6488E-02	7.7797E-02
48	.65952	7.3925E-03	.784764	1.000000	1.5602E+00	7.6488E-02	7.7797E-02
49	.68346	7.8709E-03	.771576	1.000000	1.6296E+00	7.6488E-02	7.7797E-02
50	.70839	8.3782E-03	.757739	1.000000	1.6975E+00	7.6488E-02	7.7797E-02
51	.73439	8.9164E-03	.743217	1.000000	1.7635E+00	7.6488E-02	7.7797E-02
52	.76152	9.4872E-03	.727973	1.000000	1.8268E+00	7.6488E-02	7.7797E-02
53	.78986	1.0093E-02	.711968	1.000000	1.8867E+00	7.6488E-02	7.7797E-02
54	.81953	1.0735E-02	.695159	1.000000	1.9426E+00	7.6488E-02	7.7797E-02

55	.85060	1.1416E-02	.677499	1.000000	1.9934E+00	7.6488E-02	7.7797E-02
56	.88322	1.2138E-02	.658936	1.000000	2.0385E+00	7.6488E-02	7.7797E-02
57	.91750	1.2904E-02	.639415	1.000000	2.0767E+00	7.6488E-02	7.7797E-02
58	.95361	1.3717E-02	.618876	1.000000	2.1070E+00	7.6488E-02	7.7797E-02
59	.99173	1.4579E-02	.597250	1.000000	2.1283E+00	7.6488E-02	7.7797E-02
60	1.03207	1.5493E-02	.574465	1.000000	2.1394E+00	7.6488E-02	7.7797E-02
61	1.07487	1.6463E-02	.550436	1.000000	2.1389E+00	7.6488E-02	7.7797E-02
62	1.12046	1.7491E-02	.525070	1.000000	2.1253E+00	7.6488E-02	7.7797E-02
63	1.16918	1.8582E-02	.498258	1.000000	2.0972E+00	7.6488E-02	7.7797E-02
64	1.22151	1.9739E-02	.469876	1.000000	2.0528E+00	7.6488E-02	7.7797E-02
65	1.27802	2.0966E-02	.439776	1.000000	1.9903E+00	7.6488E-02	7.7797E-02
66	1.33947	2.2268E-02	.407776	1.000000	1.9076E+00	7.6488E-02	7.7797E-02
67	1.40688	2.3648E-02	.373648	1.000000	1.8026E+00	7.6488E-02	7.7797E-02
68	1.48167	2.5112E-02	.337090	1.000000	1.6727E+00	7.6488E-02	7.7797E-02
69	1.56596	2.6665E-02	.297677	1.000000	1.5148E+00	7.6488E-02	7.7797E-02
70	1.66312	2.8312E-02	.254752	1.000000	1.3252E+00	7.6488E-02	7.7797E-02
71	1.77927	3.0059E-02	.207168	1.000000	1.0974E+00	7.6488E-02	7.7797E-02
72	1.92812	3.1912E-02	.152385	1.000000	8.1376E-01	7.6488E-02	7.7797E-02
73	2.17173	3.3878E-02	.077687	1.000000	3.1403E-01	7.6488E-02	7.7797E-02
74	4.03810	3.5962E-02	.005006	1.000000	1.5003E-02	7.6488E-02	7.7797E-02
75	5.34780	3.8173E-02	.000000	1.000000	.0	7.6488E-02	7.7797E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 7.5000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.954223	1.000000	2.8188E-01	7.6488E-02	9.0101E-02
2	.04059	3.0059E-05	.954223	1.000000	2.8188E-01	7.6488E-02	9.0101E-02
3	.05827	6.1942E-05	.952955	1.000000	2.9144E-01	7.6488E-02	9.0101E-02
4	.07248	9.5758E-05	.951377	1.000000	3.0335E-01	7.6488E-02	9.0101E-02
5	.08501	1.3162E-04	.949619	1.000000	3.1668E-01	7.6488E-02	9.0101E-02
6	.09656	1.6967E-04	.947722	1.000000	3.3112E-01	7.6488E-02	9.0101E-02
7	.10748	2.1001E-04	.945702	1.000000	3.4655E-01	7.6488E-02	9.0101E-02
8	.11799	2.5281E-04	.943569	1.000000	3.6293E-01	7.6488E-02	9.0101E-02
9	.12822	2.9820E-04	.941326	1.000000	3.8024E-01	7.6488E-02	9.0101E-02
10	.13827	3.4635E-04	.938973	1.000000	3.9847E-01	7.6488E-02	9.0101E-02
11	.14821	3.9741E-04	.936510	1.000000	4.1764E-01	7.6488E-02	9.0101E-02
12	.15810	4.5157E-04	.933936	1.000000	4.3776E-01	7.6488E-02	9.0101E-02
13	.16798	5.0901E-04	.931249	1.000000	4.5884E-01	7.6488E-02	9.0101E-02
14	.17788	5.6994E-04	.928445	1.000000	4.8091E-01	7.6488E-02	9.0101E-02
15	.18785	6.3457E-04	.925522	1.000000	5.0397E-01	7.6488E-02	9.0101E-02
16	.19791	7.0311E-04	.922477	1.000000	5.2805E-01	7.6488E-02	9.0101E-02
17	.20808	7.7581E-04	.919305	1.000000	5.5317E-01	7.6488E-02	9.0101E-02
18	.21838	8.5292E-04	.916002	1.000000	5.7935E-01	7.6488E-02	9.0101E-02
19	.22884	9.3470E-04	.912565	1.000000	6.0660E-01	7.6488E-02	9.0101E-02
20	.23948	1.0214E-03	.908987	1.000000	6.3493E-01	7.6488E-02	9.0101E-02
21	.25031	1.1134E-03	.905265	1.000000	6.6437E-01	7.6488E-02	9.0101E-02
22	.26135	1.2110E-03	.901393	1.000000	6.9492E-01	7.6488E-02	9.0101E-02
23	.27262	1.3145E-03	.897366	1.000000	7.2660E-01	7.6488E-02	9.0101E-02
24	.28414	1.4243E-03	.893176	1.000000	7.5941E-01	7.6488E-02	9.0101E-02
25	.29592	1.5408E-03	.888819	1.000000	7.9334E-01	7.6488E-02	9.0101E-02
26	.30798	1.6642E-03	.884288	1.000000	8.2841E-01	7.6488E-02	9.0101E-02
27	.32034	1.7952E-03	.879575	1.000000	8.6461E-01	7.6488E-02	9.0101E-02
28	.33302	1.9342E-03	.874674	1.000000	9.0192E-01	7.6488E-02	9.0101E-02
29	.34603	2.0815E-03	.869576	1.000000	9.4034E-01	7.6488E-02	9.0101E-02
30	.35940	2.2378E-03	.864273	1.000000	9.7984E-01	7.6488E-02	9.0101E-02
31	.37314	2.4036E-03	.858758	1.000000	1.0204E+00	7.6488E-02	9.0101E-02
32	.38726	2.5794E-03	.853021	1.000000	1.0620E+00	7.6488E-02	9.0101E-02
33	.40180	2.7659E-03	.847052	1.000000	1.1045E+00	7.6488E-02	9.0101E-02
34	.41678	2.9637E-03	.840842	1.000000	1.1480E+00	7.6488E-02	9.0101E-02
35	.43221	3.1735E-03	.834380	1.000000	1.1924E+00	7.6488E-02	9.0101E-02
36	.44811	3.3960E-03	.827654	1.000000	1.2375E+00	7.6488E-02	9.0101E-02
37	.46452	3.6320E-03	.820654	1.000000	1.2834E+00	7.6488E-02	9.0101E-02
38	.48146	3.8823E-03	.813367	1.000000	1.3299E+00	7.6488E-02	9.0101E-02
39	.49895	4.1478E-03	.805779	1.000000	1.3770E+00	7.6488E-02	9.0101E-02
40	.51703	4.4294E-03	.797878	1.000000	1.4244E+00	7.6488E-02	9.0101E-02
41	.53572	4.7281E-03	.789648	1.000000	1.4721E+00	7.6488E-02	9.0101E-02
42	.55506	5.0449E-03	.781075	1.000000	1.5200E+00	7.6488E-02	9.0101E-02
43	.57509	5.3809E-03	.772142	1.000000	1.5678E+00	7.6488E-02	9.0101E-02
44	.59583	5.7373E-03	.762832	1.000000	1.6153E+00	7.6488E-02	9.0101E-02
45	.61732	6.1153E-03	.753126	1.000000	1.6625E+00	7.6488E-02	9.0101E-02
46	.63962	6.5162E-03	.743006	1.000000	1.7089E+00	7.6488E-02	9.0101E-02
47	.66277	6.9415E-03	.732451	1.000000	1.7545E+00	7.6488E-02	9.0101E-02
48	.68681	7.3925E-03	.721440	1.000000	1.7988E+00	7.6488E-02	9.0101E-02
49	.71181	7.8709E-03	.709949	1.000000	1.8417E+00	7.6488E-02	9.0101E-02
50	.73781	8.3782E-03	.697954	1.000000	1.8827E+00	7.6488E-02	9.0101E-02
51	.76489	8.9164E-03	.685428	1.000000	1.9215E+00	7.6488E-02	9.0101E-02
52	.79311	9.4872E-03	.672345	1.000000	1.9578E+00	7.6488E-02	9.0101E-02
53	.82256	1.0093E-02	.658674	1.000000	1.9910E+00	7.6488E-02	9.0101E-02
54	.85332	1.0735E-02	.644382	1.000000	2.0207E+00	7.6488E-02	9.0101E-02

55	.88548	1.1416E-02	.629436	1.000000	2.0464E+00	7.6488E-02	9.0101E-02
56	.91917	1.2138E-02	.613799	1.000000	2.0676E+00	7.6488E-02	9.0101E-02
57	.95448	1.2904E-02	.597431	1.000000	2.0836E+00	7.6488E-02	9.0101E-02
58	.99158	1.3717E-02	.580287	1.000000	2.0939E+00	7.6488E-02	9.0101E-02
59	1.03060	1.4579E-02	.562321	1.000000	2.0976E+00	7.6488E-02	9.0101E-02
60	1.07174	1.5493E-02	.543481	1.000000	2.0941E+00	7.6488E-02	9.0101E-02
61	1.11521	1.6463E-02	.523709	1.000000	2.0826E+00	7.6488E-02	9.0101E-02
62	1.16126	1.7491E-02	.502942	1.000000	2.0622E+00	7.6488E-02	9.0101E-02
63	1.21017	1.8582E-02	.481108	1.000000	2.0319E+00	7.6488E-02	9.0101E-02
64	1.26231	1.9739E-02	.458127	1.000000	1.9907E+00	7.6488E-02	9.0101E-02
65	1.31811	2.0966E-02	.433905	1.000000	1.9376E+00	7.6488E-02	9.0101E-02
66	1.37811	2.2268E-02	.408333	1.000000	1.8713E+00	7.6488E-02	9.0101E-02
67	1.44300	2.3648E-02	.381283	1.000000	1.7906E+00	7.6488E-02	9.0101E-02
68	1.51369	2.5112E-02	.352594	1.000000	1.6940E+00	7.6488E-02	9.0101E-02
69	1.59139	2.6665E-02	.322064	1.000000	1.5798E+00	7.6488E-02	9.0101E-02
70	1.67781	2.8312E-02	.289424	1.000000	1.4462E+00	7.6488E-02	9.0101E-02
71	1.77554	3.0059E-02	.254287	1.000000	1.2908E+00	7.6488E-02	9.0101E-02
72	1.88874	3.1912E-02	.216037	1.000000	1.1103E+00	7.6488E-02	9.0101E-02
73	2.02519	3.3878E-02	.173529	1.000000	8.9947E-01	7.6488E-02	9.0101E-02
74	2.20349	3.5962E-02	.123910	1.000000	6.4255E-01	7.6488E-02	9.0101E-02
75	2.53379	3.8173E-02	.052646	1.000000	1.8851E-01	7.6488E-02	9.0101E-02
76	6.20473	4.0518E-02	.001984	1.000000	5.7482E-03	7.6488E-02	9.0101E-02
77	8.51602	4.3006E-02	.000000	1.000000	.0	7.6488E-02	9.0101E-02

MERGED JETMIX AND SSFD PROFILE
FOR X = 9.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.840127	1.000000	8.1897E-01	7.6488E-02	1.0727E-01
2	.04326	3.0059E-05	.840127	1.000000	8.1897E-01	7.6488E-02	1.0727E-01
3	.06210	6.1942E-05	.839269	1.000000	8.2740E-01	7.6488E-02	1.0727E-01
4	.07723	9.5758E-05	.838193	1.000000	8.3790E-01	7.6488E-02	1.0727E-01
5	.09058	1.3162E-04	.836985	1.000000	8.4959E-01	7.6488E-02	1.0727E-01
6	.10288	1.6967E-04	.835672	1.000000	8.6219E-01	7.6488E-02	1.0727E-01
7	.11450	2.1001E-04	.834264	1.000000	8.7559E-01	7.6488E-02	1.0727E-01
8	.12568	2.5281E-04	.832765	1.000000	8.8971E-01	7.6488E-02	1.0727E-01
9	.13656	2.9820E-04	.831178	1.000000	9.0452E-01	7.6488E-02	1.0727E-01
10	.14724	3.4635E-04	.829500	1.000000	9.2001E-01	7.6488E-02	1.0727E-01
11	.15781	3.9741E-04	.827732	1.000000	9.3617E-01	7.6488E-02	1.0727E-01
12	.16831	4.5157E-04	.825871	1.000000	9.5299E-01	7.6488E-02	1.0727E-01
13	.17880	5.0901E-04	.823915	1.000000	9.7047E-01	7.6488E-02	1.0727E-01
14	.18932	5.6994E-04	.821860	1.000000	9.8860E-01	7.6488E-02	1.0727E-01
15	.19990	6.3457E-04	.819704	1.000000	1.0074E+00	7.6488E-02	1.0727E-01
16	.21057	7.0311E-04	.817443	1.000000	1.0268E+00	7.6488E-02	1.0727E-01
17	.22135	7.7581E-04	.815074	1.000000	1.0469E+00	7.6488E-02	1.0727E-01
18	.23228	8.5292E-04	.812592	1.000000	1.0677E+00	7.6488E-02	1.0727E-01
19	.24336	9.3470E-04	.809993	1.000000	1.0891E+00	7.6488E-02	1.0727E-01
20	.25463	1.0214E-03	.807274	1.000000	1.1111E+00	7.6488E-02	1.0727E-01
21	.26609	1.1134E-03	.804429	1.000000	1.1338E+00	7.6488E-02	1.0727E-01
22	.27778	1.2110E-03	.801453	1.000000	1.1571E+00	7.6488E-02	1.0727E-01
23	.28970	1.3145E-03	.798343	1.000000	1.1811E+00	7.6488E-02	1.0727E-01
24	.30188	1.4243E-03	.795092	1.000000	1.2056E+00	7.6488E-02	1.0727E-01
25	.31434	1.5408E-03	.791694	1.000000	1.2308E+00	7.6488E-02	1.0727E-01
26	.32708	1.6642E-03	.788145	1.000000	1.2566E+00	7.6488E-02	1.0727E-01
27	.34014	1.7952E-03	.784439	1.000000	1.2829E+00	7.6488E-02	1.0727E-01
28	.35353	1.9342E-03	.780568	1.000000	1.3098E+00	7.6488E-02	1.0727E-01
29	.36726	2.0815E-03	.776527	1.000000	1.3372E+00	7.6488E-02	1.0727E-01
30	.38136	2.2378E-03	.772308	1.000000	1.3651E+00	7.6488E-02	1.0727E-01
31	.39584	2.4036E-03	.767905	1.000000	1.3934E+00	7.6488E-02	1.0727E-01
32	.41073	2.5794E-03	.763310	1.000000	1.4222E+00	7.6488E-02	1.0727E-01
33	.42605	2.7659E-03	.758516	1.000000	1.4514E+00	7.6488E-02	1.0727E-01
34	.44181	2.9637E-03	.753514	1.000000	1.4809E+00	7.6488E-02	1.0727E-01
35	.45805	3.1735E-03	.748296	1.000000	1.5107E+00	7.6488E-02	1.0727E-01
36	.47478	3.3960E-03	.742852	1.000000	1.5408E+00	7.6488E-02	1.0727E-01
37	.49203	3.6320E-03	.737174	1.000000	1.5710E+00	7.6488E-02	1.0727E-01
38	.50983	3.8823E-03	.731251	1.000000	1.6013E+00	7.6488E-02	1.0727E-01
39	.52820	4.1478E-03	.725074	1.000000	1.6316E+00	7.6488E-02	1.0727E-01
40	.54717	4.4294E-03	.718632	1.000000	1.6618E+00	7.6488E-02	1.0727E-01
41	.56678	4.7281E-03	.711912	1.000000	1.6919E+00	7.6488E-02	1.0727E-01
42	.58705	5.0449E-03	.704904	1.000000	1.7216E+00	7.6488E-02	1.0727E-01
43	.60801	5.3809E-03	.697595	1.000000	1.7510E+00	7.6488E-02	1.0727E-01
44	.62972	5.7373E-03	.689972	1.000000	1.7799E+00	7.6488E-02	1.0727E-01
45	.65220	6.1153E-03	.682020	1.000000	1.8081E+00	7.6488E-02	1.0727E-01
46	.67550	6.5162E-03	.673726	1.000000	1.8354E+00	7.6488E-02	1.0727E-01
47	.69965	6.9415E-03	.665073	1.000000	1.8618E+00	7.6488E-02	1.0727E-01
48	.72472	7.3925E-03	.656046	1.000000	1.8870E+00	7.6488E-02	1.0727E-01
49	.75076	7.8709E-03	.646626	1.000000	1.9109E+00	7.6488E-02	1.0727E-01
50	.77781	8.3782E-03	.636797	1.000000	1.9331E+00	7.6488E-02	1.0727E-01
51	.80594	8.9164E-03	.626538	1.000000	1.9535E+00	7.6488E-02	1.0727E-01

52	.83523	9.4872E-03	.615828	1.000000	1.9719E+00	7.6488E-02	1.0727E-01
53	.86573	1.0093E-02	.604647	1.000000	1.9879E+00	7.6488E-02	1.0727E-01
54	.89754	1.0735E-02	.592969	1.000000	2.0012E+00	7.6488E-02	1.0727E-01
55	.93074	1.1416E-02	.580772	1.000000	2.0115E+00	7.6488E-02	1.0727E-01
56	.96542	1.2138E-02	.568027	1.000000	2.0185E+00	7.6488E-02	1.0727E-01
57	1.00171	1.2904E-02	.554706	1.000000	2.0218E+00	7.6488E-02	1.0727E-01
58	1.03973	1.3717E-02	.540777	1.000000	2.0210E+00	7.6488E-02	1.0727E-01
59	1.07960	1.4579E-02	.526209	1.000000	2.0156E+00	7.6488E-02	1.0727E-01
60	1.12149	1.5493E-02	.510964	1.000000	2.0052E+00	7.6488E-02	1.0727E-01
61	1.16558	1.6463E-02	.495003	1.000000	1.9892E+00	7.6488E-02	1.0727E-01
62	1.21208	1.7491E-02	.478283	1.000000	1.9671E+00	7.6488E-02	1.0727E-01
63	1.26122	1.8582E-02	.460755	1.000000	1.9384E+00	7.6488E-02	1.0727E-01
64	1.31329	1.9739E-02	.442367	1.000000	1.9023E+00	7.6488E-02	1.0727E-01
65	1.36861	2.0966E-02	.423060	1.000000	1.8582E+00	7.6488E-02	1.0727E-01
66	1.42760	2.2268E-02	.402766	1.000000	1.8055E+00	7.6488E-02	1.0727E-01
67	1.49074	2.3648E-02	.381406	1.000000	1.7432E+00	7.6488E-02	1.0727E-01
68	1.55864	2.5112E-02	.358890	1.000000	1.6705E+00	7.6488E-02	1.0727E-01
69	1.63208	2.6665E-02	.335110	1.000000	1.5865E+00	7.6488E-02	1.0727E-01
70	1.71207	2.8312E-02	.309931	1.000000	1.4901E+00	7.6488E-02	1.0727E-01
71	1.79997	3.0059E-02	.283183	1.000000	1.3802E+00	7.6488E-02	1.0727E-01
72	1.89770	3.1912E-02	.254637	1.000000	1.2553E+00	7.6488E-02	1.0727E-01
73	2.00812	3.3878E-02	.223964	1.000000	1.1137E+00	7.6488E-02	1.0727E-01
74	2.13584	3.5962E-02	.190640	1.000000	9.5310E-01	7.6488E-02	1.0727E-01
75	2.28938	3.8173E-02	.153693	1.000000	7.6917E-01	7.6488E-02	1.0727E-01
76	2.48877	4.0518E-02	.110730	1.000000	5.4935E-01	7.6488E-02	1.0727E-01
77	2.84274	4.3006E-02	.050036	1.000000	1.7963E-01	7.6488E-02	1.0727E-01
78	6.30321	4.5644E-02	.002279	1.000000	6.8585E-03	7.6488E-02	1.0727E-01
79	8.56149	4.8442E-02	.000000	1.000000	.0	7.6488E-02	1.0727E-01

MERGED JETMIX AND SSFD PROFILE
FOR X = 11.0000

	Y	PSI	UD	THO	ED	RHO	XLN
1	.00000	.0	.699853	1.000000	1.1978E+00	7.6488E-02	1.3394E-01
2	.06385	5.4558E-05	.699853	1.000000	1.1978E+00	7.6488E-02	1.3394E-01
3	.09167	1.1242E-04	.699034	1.000000	1.2038E+00	7.6488E-02	1.3394E-01
4	.11401	1.7380E-04	.698002	1.000000	1.2112E+00	7.6488E-02	1.3394E-01
5	.13371	2.3890E-04	.696838	1.000000	1.2194E+00	7.6488E-02	1.3394E-01
6	.15188	3.0794E-04	.695567	1.000000	1.2283E+00	7.6488E-02	1.3394E-01
7	.16905	3.8118E-04	.694198	1.000000	1.2378E+00	7.6488E-02	1.3394E-01
8	.18557	4.5885E-04	.692733	1.000000	1.2478E+00	7.6488E-02	1.3394E-01
9	.20165	5.4123E-04	.691173	1.000000	1.2583E+00	7.6488E-02	1.3394E-01
10	.21744	6.2861E-04	.689517	1.000000	1.2694E+00	7.6488E-02	1.3394E-01
11	.23306	7.2129E-04	.687762	1.000000	1.2809E+00	7.6488E-02	1.3394E-01
12	.24860	8.1959E-04	.685906	1.000000	1.2928E+00	7.6488E-02	1.3394E-01
13	.26413	9.2386E-04	.683944	1.000000	1.3053E+00	7.6488E-02	1.3394E-01
14	.27970	1.0344E-03	.681872	1.000000	1.3182E+00	7.6488E-02	1.3394E-01
15	.29537	1.1517E-03	.679687	1.000000	1.3316E+00	7.6488E-02	1.3394E-01
16	.31118	1.2761E-03	.677383	1.000000	1.3454E+00	7.6488E-02	1.3394E-01
17	.32716	1.4081E-03	.674956	1.000000	1.3596E+00	7.6488E-02	1.3394E-01
18	.34337	1.5480E-03	.672401	1.000000	1.3743E+00	7.6488E-02	1.3394E-01
19	.35982	1.6965E-03	.669711	1.000000	1.3894E+00	7.6488E-02	1.3394E-01
20	.37655	1.8539E-03	.666882	1.000000	1.4049E+00	7.6488E-02	1.3394E-01
21	.39359	2.0209E-03	.663906	1.000000	1.4207E+00	7.6488E-02	1.3394E-01
22	.41097	2.1980E-03	.660779	1.000000	1.4369E+00	7.6488E-02	1.3394E-01
23	.42872	2.3859E-03	.657492	1.000000	1.4534E+00	7.6488E-02	1.3394E-01
24	.44687	2.5851E-03	.654040	1.000000	1.4702E+00	7.6488E-02	1.3394E-01
25	.46544	2.7964E-03	.650415	1.000000	1.4873E+00	7.6488E-02	1.3394E-01
26	.48447	3.0206E-03	.646610	1.000000	1.5045E+00	7.6488E-02	1.3394E-01
27	.50398	3.2583E-03	.642616	1.000000	1.5219E+00	7.6488E-02	1.3394E-01
28	.52401	3.5105E-03	.638425	1.000000	1.5395E+00	7.6488E-02	1.3394E-01
29	.54458	3.7779E-03	.634030	1.000000	1.5571E+00	7.6488E-02	1.3394E-01
30	.56573	4.0616E-03	.629420	1.000000	1.5747E+00	7.6488E-02	1.3394E-01
31	.58749	4.3625E-03	.624587	1.000000	1.5922E+00	7.6488E-02	1.3394E-01
32	.60990	4.6816E-03	.619520	1.000000	1.6096E+00	7.6488E-02	1.3394E-01
33	.63299	5.0201E-03	.614211	1.000000	1.6268E+00	7.6488E-02	1.3394E-01
34	.65679	5.3791E-03	.608647	1.000000	1.6436E+00	7.6488E-02	1.3394E-01
35	.68136	5.7599E-03	.602817	1.000000	1.6601E+00	7.6488E-02	1.3394E-01
36	.70673	6.1637E-03	.596710	1.000000	1.6759E+00	7.6488E-02	1.3394E-01
37	.73295	6.5921E-03	.590314	1.000000	1.6912E+00	7.6488E-02	1.3394E-01
38	.76006	7.0464E-03	.583616	1.000000	1.7057E+00	7.6488E-02	1.3394E-01
39	.78812	7.5283E-03	.576601	1.000000	1.7193E+00	7.6488E-02	1.3394E-01
40	.81719	8.0394E-03	.569256	1.000000	1.7318E+00	7.6488E-02	1.3394E-01
41	.84731	8.5815E-03	.561566	1.000000	1.7431E+00	7.6488E-02	1.3394E-01
42	.87856	9.1565E-03	.553514	1.000000	1.7531E+00	7.6488E-02	1.3394E-01
43	.91101	9.7663E-03	.545084	1.000000	1.7614E+00	7.6488E-02	1.3394E-01
44	.94472	1.0413E-02	.536258	1.000000	1.7680E+00	7.6488E-02	1.3394E-01
45	.97979	1.1099E-02	.527018	1.000000	1.7726E+00	7.6488E-02	1.3394E-01
46	1.01630	1.1827E-02	.517343	1.000000	1.7750E+00	7.6488E-02	1.3394E-01
47	1.05436	1.2599E-02	.507213	1.000000	1.7749E+00	7.6488E-02	1.3394E-01
48	1.09406	1.3417E-02	.496605	1.000000	1.7722E+00	7.6488E-02	1.3394E-01
49	1.13554	1.4286E-02	.485495	1.000000	1.7664E+00	7.6488E-02	1.3394E-01
50	1.17893	1.5206E-02	.473856	1.000000	1.7573E+00	7.6488E-02	1.3394E-01
51	1.22437	1.6183E-02	.461662	1.000000	1.7446E+00	7.6488E-02	1.3394E-01
52	1.27205	1.7219E-02	.448883	1.000000	1.7279E+00	7.6488E-02	1.3394E-01
53	1.32215	1.8318E-02	.435485	1.000000	1.7070E+00	7.6488E-02	1.3394E-01

54	1.37491	1.9483E-02	.421434	1.000000	1.6813E+00	7.6488E-02	1.3394E-01
55	1.43058	2.0720E-02	.406690	1.000000	1.6505E+00	7.6488E-02	1.3394E-01
56	1.48946	2.2031E-02	.391210	1.000000	1.6141E+00	7.6488E-02	1.3394E-01
57	1.55190	2.3421E-02	.374946	1.000000	1.5717E+00	7.6488E-02	1.3394E-01
58	1.61834	2.4896E-02	.357845	1.000000	1.5228E+00	7.6488E-02	1.3394E-01
59	1.68929	2.6461E-02	.339842	1.000000	1.4669E+00	7.6488E-02	1.3394E-01
60	1.76539	2.8120E-02	.320867	1.000000	1.4034E+00	7.6488E-02	1.3394E-01
61	1.84742	2.9880E-02	.300834	1.000000	1.3316E+00	7.6488E-02	1.3394E-01
62	1.93643	3.1746E-02	.279640	1.000000	1.2511E+00	7.6488E-02	1.3394E-01
63	2.03376	3.3726E-02	.257155	1.000000	1.1609E+00	7.6488E-02	1.3394E-01
64	2.14130	3.5826E-02	.233210	1.000000	1.0602E+00	7.6488E-02	1.3394E-01
65	2.26173	3.8053E-02	.207572	1.000000	9.4782E-01	7.6488E-02	1.3394E-01
66	2.39924	4.0415E-02	.179900	1.000000	8.2227E-01	7.6488E-02	1.3394E-01
67	2.56094	4.2921E-02	.149626	1.000000	6.8081E-01	7.6488E-02	1.3394E-01
68	2.76112	4.5578E-02	.115624	1.000000	5.1724E-01	7.6488E-02	1.3394E-01
69	3.04273	4.8397E-02	.073926	1.000000	3.0358E-01	7.6488E-02	1.3394E-01
70	3.98658	5.1387E-02	.014016	1.000000	3.4850E-02	7.6488E-02	1.3394E-01
71	31.20328	5.4558E-02	.000087	1.000000	2.1136E-04	7.6488E-02	1.3394E-01
72	44.60357	5.7921E-02	.000000	1.000000	.0	7.6488E-02	1.3394E-01

MERGED JETMIX AND SSPD PROFILE
FOR X = 12.1273

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	0	.638392	1.000000	1.2041E+00	7.6488E-02	1.3500E-01
2	.06685	5.4558E-05	.638392	1.000000	1.2041E+00	7.6488E-02	1.3500E-01
3	.09598	1.1242E-04	.637763	1.000000	1.2078E+00	7.6488E-02	1.3500E-01
4	.11936	1.7380E-04	.636970	1.000000	1.2125E+00	7.6488E-02	1.3500E-01
5	.13999	2.3890E-04	.636074	1.000000	1.2176E+00	7.6488E-02	1.3500E-01
6	.15899	3.0794E-04	.635093	1.000000	1.2233E+00	7.6488E-02	1.3500E-01
7	.17695	3.8118E-04	.634035	1.000000	1.2293E+00	7.6488E-02	1.3500E-01
8	.19423	4.5885E-04	.632900	1.000000	1.2356E+00	7.6488E-02	1.3500E-01
9	.21104	5.4123E-04	.631689	1.000000	1.2424E+00	7.6488E-02	1.3500E-01
10	.22755	6.2861E-04	.630400	1.000000	1.2494E+00	7.6488E-02	1.3500E-01
11	.24388	7.2129E-04	.629032	1.000000	1.2568E+00	7.6488E-02	1.3500E-01
12	.26011	8.1959E-04	.627580	1.000000	1.2646E+00	7.6488E-02	1.3500E-01
13	.27633	9.2386E-04	.626042	1.000000	1.2727E+00	7.6488E-02	1.3500E-01
14	.29259	1.0344E-03	.624414	1.000000	1.2811E+00	7.6488E-02	1.3500E-01
15	.30894	1.1517E-03	.622692	1.000000	1.2898E+00	7.6488E-02	1.3500E-01
16	.32543	1.2761E-03	.620872	1.000000	1.2989E+00	7.6488E-02	1.3500E-01
17	.34211	1.4081E-03	.618950	1.000000	1.3083E+00	7.6488E-02	1.3500E-01
18	.35900	1.5480E-03	.616920	1.000000	1.3181E+00	7.6488E-02	1.3500E-01
19	.37615	1.6965E-03	.614779	1.000000	1.3281E+00	7.6488E-02	1.3500E-01
20	.39358	1.8539E-03	.612519	1.000000	1.3385E+00	7.6488E-02	1.3500E-01
21	.41133	2.0209E-03	.610137	1.000000	1.3492E+00	7.6488E-02	1.3500E-01
22	.42942	2.1980E-03	.607626	1.000000	1.3602E+00	7.6488E-02	1.3500E-01
23	.44789	2.3859E-03	.604980	1.000000	1.3714E+00	7.6488E-02	1.3500E-01
24	.46676	2.5851E-03	.602193	1.000000	1.3829E+00	7.6488E-02	1.3500E-01
25	.48607	2.7964E-03	.599259	1.000000	1.3946E+00	7.6488E-02	1.3500E-01
26	.50584	3.0206E-03	.596170	1.000000	1.4066E+00	7.6488E-02	1.3500E-01
27	.52611	3.2583E-03	.592919	1.000000	1.4187E+00	7.6488E-02	1.3500E-01
28	.54690	3.5105E-03	.589499	1.000000	1.4309E+00	7.6488E-02	1.3500E-01
29	.56824	3.7779E-03	.585902	1.000000	1.4433E+00	7.6488E-02	1.3500E-01
30	.59017	4.0616E-03	.582120	1.000000	1.4557E+00	7.6488E-02	1.3500E-01
31	.61271	4.3625E-03	.578144	1.000000	1.4681E+00	7.6488E-02	1.3500E-01
32	.63592	4.6816E-03	.573966	1.000000	1.4805E+00	7.6488E-02	1.3500E-01
33	.65981	5.0201E-03	.569576	1.000000	1.4927E+00	7.6488E-02	1.3500E-01
34	.68443	5.3791E-03	.564964	1.000000	1.5048E+00	7.6488E-02	1.3500E-01
35	.70982	5.7599E-03	.560121	1.000000	1.5167E+00	7.6488E-02	1.3500E-01
36	.73602	6.1637E-03	.555035	1.000000	1.5282E+00	7.6488E-02	1.3500E-01
37	.76307	6.5921E-03	.549695	1.000000	1.5393E+00	7.6488E-02	1.3500E-01
38	.79103	7.0464E-03	.544090	1.000000	1.5499E+00	7.6488E-02	1.3500E-01
39	.81993	7.5283E-03	.538208	1.000000	1.5599E+00	7.6488E-02	1.3500E-01
40	.84985	8.0394E-03	.532035	1.000000	1.5692E+00	7.6488E-02	1.3500E-01
41	.88083	8.5815E-03	.525559	1.000000	1.5775E+00	7.6488E-02	1.3500E-01
42	.91293	9.1565E-03	.518764	1.000000	1.5849E+00	7.6488E-02	1.3500E-01
43	.94623	9.7663E-03	.511636	1.000000	1.5912E+00	7.6488E-02	1.3500E-01
44	.98079	1.0413E-02	.504159	1.000000	1.5961E+00	7.6488E-02	1.3500E-01
45	1.01670	1.1099E-02	.496317	1.000000	1.5996E+00	7.6488E-02	1.3500E-01
46	1.05404	1.1827E-02	.488092	1.000000	1.6014E+00	7.6488E-02	1.3500E-01
47	1.09290	1.2599E-02	.479465	1.000000	1.6014E+00	7.6488E-02	1.3500E-01
48	1.13340	1.3417E-02	.470417	1.000000	1.5993E+00	7.6488E-02	1.3500E-01
49	1.17563	1.4286E-02	.460926	1.000000	1.5949E+00	7.6488E-02	1.3500E-01
50	1.21973	1.5206E-02	.450970	1.000000	1.5880E+00	7.6488E-02	1.3500E-01
51	1.26584	1.6183E-02	.440526	1.000000	1.5783E+00	7.6488E-02	1.3500E-01
52	1.31412	1.7219E-02	.429566	1.000000	1.5656E+00	7.6488E-02	1.3500E-01
53	1.36474	1.8318E-02	.418064	1.000000	1.5495E+00	7.6488E-02	1.3500E-01

54	1.41791	1.9483E-02	.405990	1.000000	1.5297E+00	7.6488E-02	1.3500E-01
55	1.47386	2.0720E-02	.393311	1.000000	1.5060E+00	7.6488E-02	1.3500E-01
56	1.53285	2.2031E-02	.379991	1.000000	1.4779E+00	7.6488E-02	1.3500E-01
57	1.59521	2.3421E-02	.365991	1.000000	1.4451E+00	7.6488E-02	1.3500E-01
58	1.66128	2.4896E-02	.351267	1.000000	1.4072E+00	7.6488E-02	1.3500E-01
59	1.73151	2.6461E-02	.335771	1.000000	1.3638E+00	7.6488E-02	1.3500E-01
60	1.80642	2.8120E-02	.319445	1.000000	1.3144E+00	7.6488E-02	1.3500E-01
61	1.88666	2.9880E-02	.302226	1.000000	1.2585E+00	7.6488E-02	1.3500E-01
62	1.97302	3.1746E-02	.284038	1.000000	1.1957E+00	7.6488E-02	1.3500E-01
63	2.06653	3.3726E-02	.264789	1.000000	1.1254E+00	7.6488E-02	1.3500E-01
64	2.16855	3.5826E-02	.244366	1.000000	1.0468E+00	7.6488E-02	1.3500E-01
65	2.28091	3.8053E-02	.222624	1.000000	9.5943E-01	7.6488E-02	1.3500E-01
66	2.40620	4.0415E-02	.199365	1.000000	8.6225E-01	7.6488E-02	1.3500E-01
67	2.54839	4.2921E-02	.174303	1.000000	7.5414E-01	7.6488E-02	1.3500E-01
68	2.71399	4.5578E-02	.146976	1.000000	6.3330E-01	7.6488E-02	1.3500E-01
69	2.91546	4.8397E-02	.116486	1.000000	4.9632E-01	7.6488E-02	1.3500E-01
70	3.18511	5.1387E-02	.080262	1.000000	3.3203E-01	7.6488E-02	1.3500E-01
71	3.79092	5.4558E-02	.025966	1.000000	6.9951E-02	7.6488E-02	1.3500E-01
72	13.89743	5.7921E-02	.000501	1.000000	1.2289E-03	7.6488E-02	1.3500E-01
73	19.56393	6.1488E-02	.000000	1.000000	.0	7.6488E-02	1.3500E-01

MERGED JETMIX AND SSFD PROFILE
FOR X = 13.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.597894	1.000000	1.1603E+00	7.6488E-02	1.4444E-01
2	.06908	5.4558E-05	.597894	1.000000	1.1603E+00	7.6488E-02	1.4444E-01
3	.09917	1.1242E-04	.597365	1.000000	1.1630E+00	7.6488E-02	1.4444E-01
4	.12334	1.7380E-04	.596697	1.000000	1.1663E+00	7.6488E-02	1.4444E-01
5	.14464	2.3890E-04	.595942	1.000000	1.1701E+00	7.6488E-02	1.4444E-01
6	.16427	3.0794E-04	.595115	1.000000	1.1742E+00	7.6488E-02	1.4444E-01
7	.18282	3.8118E-04	.594221	1.000000	1.1786E+00	7.6488E-02	1.4444E-01
8	.20066	4.5885E-04	.593262	1.000000	1.1832E+00	7.6488E-02	1.4444E-01
9	.21802	5.4123E-04	.592238	1.000000	1.1882E+00	7.6488E-02	1.4444E-01
10	.23507	6.2861E-04	.591147	1.000000	1.1934E+00	7.6488E-02	1.4444E-01
11	.25192	7.2129E-04	.589987	1.000000	1.1988E+00	7.6488E-02	1.4444E-01
12	.26867	8.1959E-04	.588755	1.000000	1.2045E+00	7.6488E-02	1.4444E-01
13	.28541	9.2386E-04	.587449	1.000000	1.2105E+00	7.6488E-02	1.4444E-01
14	.30218	1.0344E-03	.586065	1.000000	1.2167E+00	7.6488E-02	1.4444E-01
15	.31905	1.1517E-03	.584599	1.000000	1.2232E+00	7.6488E-02	1.4444E-01
16	.33606	1.2761E-03	.583049	1.000000	1.2300E+00	7.6488E-02	1.4444E-01
17	.35325	1.4081E-03	.581408	1.000000	1.2370E+00	7.6488E-02	1.4444E-01
18	.37067	1.5480E-03	.579674	1.000000	1.2443E+00	7.6488E-02	1.4444E-01
19	.38834	1.6965E-03	.577842	1.000000	1.2518E+00	7.6488E-02	1.4444E-01
20	.40630	1.8539E-03	.575907	1.000000	1.2596E+00	7.6488E-02	1.4444E-01
21	.42458	2.0209E-03	.573863	1.000000	1.2677E+00	7.6488E-02	1.4444E-01
22	.44322	2.1980E-03	.571707	1.000000	1.2759E+00	7.6488E-02	1.4444E-01
23	.46223	2.3859E-03	.569431	1.000000	1.2845E+00	7.6488E-02	1.4444E-01
24	.48166	2.5851E-03	.567031	1.000000	1.2932E+00	7.6488E-02	1.4444E-01
25	.50153	2.7964E-03	.564500	1.000000	1.3021E+00	7.6488E-02	1.4444E-01
26	.52187	3.0206E-03	.561833	1.000000	1.3113E+00	7.6488E-02	1.4444E-01
27	.54271	3.2583E-03	.559021	1.000000	1.3205E+00	7.6488E-02	1.4444E-01
28	.56408	3.5105E-03	.556060	1.000000	1.3300E+00	7.6488E-02	1.4444E-01
29	.58601	3.7779E-03	.552940	1.000000	1.3395E+00	7.6488E-02	1.4444E-01
30	.60854	4.0616E-03	.549655	1.000000	1.3491E+00	7.6488E-02	1.4444E-01
31	.63169	4.3625E-03	.546197	1.000000	1.3588E+00	7.6488E-02	1.4444E-01
32	.65551	4.6816E-03	.542558	1.000000	1.3684E+00	7.6488E-02	1.4444E-01
33	.68002	5.0201E-03	.538729	1.000000	1.3781E+00	7.6488E-02	1.4444E-01
34	.70527	5.3791E-03	.534701	1.000000	1.3876E+00	7.6488E-02	1.4444E-01
35	.73130	5.7599E-03	.530465	1.000000	1.3969E+00	7.6488E-02	1.4444E-01
36	.75814	6.1637E-03	.526010	1.000000	1.4061E+00	7.6488E-02	1.4444E-01
37	.78585	6.5921E-03	.521327	1.000000	1.4149E+00	7.6488E-02	1.4444E-01
38	.81447	7.0464E-03	.516405	1.000000	1.4234E+00	7.6488E-02	1.4444E-01
39	.84404	7.5283E-03	.511232	1.000000	1.4315E+00	7.6488E-02	1.4444E-01
40	.87462	8.0394E-03	.505797	1.000000	1.4389E+00	7.6488E-02	1.4444E-01
41	.90628	8.5815E-03	.500087	1.000000	1.4458E+00	7.6488E-02	1.4444E-01
42	.93906	9.1565E-03	.494089	1.000000	1.4519E+00	7.6488E-02	1.4444E-01
43	.97303	9.7663E-03	.487790	1.000000	1.4571E+00	7.6488E-02	1.4444E-01
44	1.00827	1.0413E-02	.481174	1.000000	1.4612E+00	7.6488E-02	1.4444E-01
45	1.04486	1.1099E-02	.474227	1.000000	1.4643E+00	7.6488E-02	1.4444E-01
46	1.08287	1.1827E-02	.466933	1.000000	1.4660E+00	7.6488E-02	1.4444E-01
47	1.12239	1.2599E-02	.459274	1.000000	1.4663E+00	7.6488E-02	1.4444E-01
48	1.16353	1.3417E-02	.451233	1.000000	1.4649E+00	7.6488E-02	1.4444E-01
49	1.20639	1.4286E-02	.442790	1.000000	1.4616E+00	7.6488E-02	1.4444E-01
50	1.25110	1.5206E-02	.433925	1.000000	1.4564E+00	7.6488E-02	1.4444E-01
51	1.29779	1.6183E-02	.424617	1.000000	1.4489E+00	7.6488E-02	1.4444E-01
52	1.34661	1.7219E-02	.414841	1.000000	1.4389E+00	7.6488E-02	1.4444E-01

53	1.39773	1.8318E-02	.404574	1.000000	1.4261E+00	7.6488E-02	1.4444E-01
54	1.45133	1.9483E-02	.393789	1.000000	1.4104E+00	7.6488E-02	1.4444E-01
55	1.50763	2.0720E-02	.382456	1.000000	1.3913E+00	7.6488E-02	1.4444E-01
56	1.56687	2.2031E-02	.370544	1.000000	1.3687E+00	7.6488E-02	1.4444E-01
57	1.62935	2.3421E-02	.358019	1.000000	1.3422E+00	7.6488E-02	1.4444E-01
58	1.69539	2.4896E-02	.344843	1.000000	1.3114E+00	7.6488E-02	1.4444E-01
59	1.76538	2.6461E-02	.330973	1.000000	1.2761E+00	7.6488E-02	1.4444E-01
60	1.83978	2.8120E-02	.316361	1.000000	1.2357E+00	7.6488E-02	1.4444E-01
61	1.91915	2.9880E-02	.300955	1.000000	1.1900E+00	7.6488E-02	1.4444E-01
62	2.00419	3.1746E-02	.284691	1.000000	1.1384E+00	7.6488E-02	1.4444E-01
63	2.09574	3.3726E-02	.267495	1.000000	1.0806E+00	7.6488E-02	1.4444E-01
64	2.19492	3.5826E-02	.249280	1.000000	1.0159E+00	7.6488E-02	1.4444E-01
65	2.30316	3.8053E-02	.229935	1.000000	9.4390E-01	7.6488E-02	1.4444E-01
66	2.42246	4.0415E-02	.209318	1.000000	8.6385E-01	7.6488E-02	1.4444E-01
67	2.55562	4.2921E-02	.187238	1.000000	7.7495E-01	7.6488E-02	1.4444E-01
68	2.70694	4.5578E-02	.163416	1.000000	6.7611E-01	7.6488E-02	1.4444E-01
69	2.88357	4.8397E-02	.137397	1.000000	5.6559E-01	7.6488E-02	1.4444E-01
70	3.09932	5.1387E-02	.108284	1.000000	4.3993E-01	7.6488E-02	1.4444E-01
71	3.39143	5.4558E-02	.073354	1.000000	2.8675E-01	7.6488E-02	1.4444E-01
72	4.11604	5.7921E-02	.020735	1.000000	5.2140E-02	7.6488E-02	1.4444E-01
73	18.38961	6.1488E-02	.000294	1.000000	7.4145E-04	7.6488E-02	1.4444E-01
74	26.05561	6.5271E-02	.000000	1.000000	.0	7.6488E-02	1.4444E-01

MERGED JETMIX AND SSFD PROFILE
FOR X = 15.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.522317	1.000000	1.0039E+00	7.6488E-02	1.6344E-01
2	.07391	5.4558E-05	.522317	1.000000	1.0039E+00	7.6488E-02	1.6344E-01
3	.10611	1.1242E-04	.521936	1.000000	1.0053E+00	7.6488E-02	1.6344E-01
4	.13195	1.7380E-04	.521454	1.000000	1.0072E+00	7.6488E-02	1.6344E-01
5	.15473	2.3890E-04	.520909	1.000000	1.0092E+00	7.6488E-02	1.6344E-01
6	.17572	3.0794E-04	.520311	1.000000	1.0114E+00	7.6488E-02	1.6344E-01
7	.19556	3.8118E-04	.519665	1.000000	1.0138E+00	7.6488E-02	1.6344E-01
8	.21463	4.5885E-04	.518971	1.000000	1.0164E+00	7.6488E-02	1.6344E-01
9	.23318	5.4123E-04	.518228	1.000000	1.0191E+00	7.6488E-02	1.6344E-01
10	.25139	6.2861E-04	.517437	1.000000	1.0219E+00	7.6488E-02	1.6344E-01
11	.26939	7.2129E-04	.516594	1.000000	1.0249E+00	7.6488E-02	1.6344E-01
12	.28728	8.1959E-04	.515698	1.000000	1.0280E+00	7.6488E-02	1.6344E-01
13	.30515	9.2386E-04	.514746	1.000000	1.0313E+00	7.6488E-02	1.6344E-01
14	.32305	1.0344E-03	.513736	1.000000	1.0348E+00	7.6488E-02	1.6344E-01
15	.34105	1.1517E-03	.512665	1.000000	1.0384E+00	7.6488E-02	1.6344E-01
16	.35919	1.2761E-03	.511530	1.000000	1.0422E+00	7.6488E-02	1.6344E-01
17	.37752	1.4081E-03	.510328	1.000000	1.0461E+00	7.6488E-02	1.6344E-01
18	.39608	1.5480E-03	.509055	1.000000	1.0502E+00	7.6488E-02	1.6344E-01
19	.41491	1.6965E-03	.507708	1.000000	1.0545E+00	7.6488E-02	1.6344E-01
20	.43404	1.8539E-03	.506282	1.000000	1.0589E+00	7.6488E-02	1.6344E-01
21	.45350	2.0209E-03	.504774	1.000000	1.0635E+00	7.6488E-02	1.6344E-01
22	.47333	2.1980E-03	.503180	1.000000	1.0683E+00	7.6488E-02	1.6344E-01
23	.49356	2.3859E-03	.501494	1.000000	1.0732E+00	7.6488E-02	1.6344E-01
24	.51421	2.5851E-03	.499713	1.000000	1.0782E+00	7.6488E-02	1.6344E-01
25	.53533	2.7964E-03	.497832	1.000000	1.0834E+00	7.6488E-02	1.6344E-01
26	.55693	3.0206E-03	.495844	1.000000	1.0888E+00	7.6488E-02	1.6344E-01
27	.57905	3.2583E-03	.493746	1.000000	1.0942E+00	7.6488E-02	1.6344E-01
28	.60172	3.5105E-03	.491530	1.000000	1.0998E+00	7.6488E-02	1.6344E-01
29	.62497	3.7779E-03	.489192	1.000000	1.1055E+00	7.6488E-02	1.6344E-01
30	.64884	4.0616E-03	.486725	1.000000	1.1113E+00	7.6488E-02	1.6344E-01
31	.67335	4.3625E-03	.484123	1.000000	1.1171E+00	7.6488E-02	1.6344E-01
32	.69855	4.6816E-03	.481378	1.000000	1.1230E+00	7.6488E-02	1.6344E-01
33	.72447	5.0201E-03	.478484	1.000000	1.1289E+00	7.6488E-02	1.6344E-01
34	.75114	5.3791E-03	.475434	1.000000	1.1348E+00	7.6488E-02	1.6344E-01
35	.77862	5.7599E-03	.472218	1.000000	1.1406E+00	7.6488E-02	1.6344E-01
36	.80693	6.1637E-03	.468830	1.000000	1.1464E+00	7.6488E-02	1.6344E-01
37	.83612	6.5921E-03	.465261	1.000000	1.1520E+00	7.6488E-02	1.6344E-01
38	.86624	7.0464E-03	.461501	1.000000	1.1575E+00	7.6488E-02	1.6344E-01
39	.89734	7.5283E-03	.457542	1.000000	1.1628E+00	7.6488E-02	1.6344E-01
40	.92946	8.0394E-03	.453374	1.000000	1.1678E+00	7.6488E-02	1.6344E-01
41	.96267	8.5815E-03	.448986	1.000000	1.1724E+00	7.6488E-02	1.6344E-01
42	.99702	9.1565E-03	.444367	1.000000	1.1767E+00	7.6488E-02	1.6344E-01
43	1.03258	9.7663E-03	.439506	1.000000	1.1804E+00	7.6488E-02	1.6344E-01
44	1.06941	1.0413E-02	.434392	1.000000	1.1836E+00	7.6488E-02	1.6344E-01
45	1.10759	1.1099E-02	.429011	1.000000	1.1862E+00	7.6488E-02	1.6344E-01
46	1.14719	1.1827E-02	.423351	1.000000	1.1880E+00	7.6488E-02	1.6344E-01
47	1.18830	1.2599E-02	.417397	1.000000	1.1889E+00	7.6488E-02	1.6344E-01
48	1.23102	1.3417E-02	.411135	1.000000	1.1888E+00	7.6488E-02	1.6344E-01
49	1.27544	1.4286E-02	.404549	1.000000	1.1877E+00	7.6488E-02	1.6344E-01
50	1.32168	1.5206E-02	.397623	1.000000	1.1852E+00	7.6488E-02	1.6344E-01
51	1.36985	1.6183E-02	.390338	1.000000	1.1814E+00	7.6488E-02	1.6344E-01
52	1.42010	1.7219E-02	.382678	1.000000	1.1761E+00	7.6488E-02	1.6344E-01

53	1.47257	1.8318E-02	.374621	1.000000	1.1690E+00	7.6488E-02	1.6344E-01
54	1.52743	1.9483E-02	.366147	1.000000	1.1600E+00	7.6488E-02	1.6344E-01
55	1.58486	2.0720E-02	.357233	1.000000	1.1489E+00	7.6488E-02	1.6344E-01
56	1.64509	2.2031E-02	.347853	1.000000	1.1354E+00	7.6488E-02	1.6344E-01
57	1.70834	2.3421E-02	.337983	1.000000	1.1195E+00	7.6488E-02	1.6344E-01
58	1.77490	2.4896E-02	.327593	1.000000	1.1007E+00	7.6488E-02	1.6344E-01
59	1.84507	2.6461E-02	.316651	1.000000	1.0789E+00	7.6488E-02	1.6344E-01
60	1.91925	2.8120E-02	.305123	1.000000	1.0538E+00	7.6488E-02	1.6344E-01
61	1.99785	2.9880E-02	.292970	1.000000	1.0250E+00	7.6488E-02	1.6344E-01
62	2.08140	3.1746E-02	.280148	1.000000	9.9236E-01	7.6488E-02	1.6344E-01
63	2.17052	3.3726E-02	.266609	1.000000	9.5545E-01	7.6488E-02	1.6344E-01
64	2.26600	3.5826E-02	.252296	1.000000	9.1393E-01	7.6488E-02	1.6344E-01
65	2.36879	3.8053E-02	.237140	1.000000	8.6741E-01	7.6488E-02	1.6344E-01
66	2.48013	4.0415E-02	.221063	1.000000	8.1546E-01	7.6488E-02	1.6344E-01
67	2.60166	4.2921E-02	.203963	1.000000	7.5762E-01	7.6488E-02	1.6344E-01
68	2.73560	4.5578E-02	.185712	1.000000	6.9332E-01	7.6488E-02	1.6344E-01
69	2.88513	4.8397E-02	.166137	1.000000	6.2190E-01	7.6488E-02	1.6344E-01
70	3.05510	5.1387E-02	.144985	1.000000	5.4240E-01	7.6488E-02	1.6344E-01
71	3.25361	5.4558E-02	.121849	1.000000	4.5336E-01	7.6488E-02	1.6344E-01
72	3.49634	5.7921E-02	.095932	1.000000	3.5181E-01	7.6488E-02	1.6344E-01
73	3.82618	6.1488E-02	.064642	1.000000	2.2657E-01	7.6488E-02	1.6344E-01
74	4.67710	6.5271E-02	.017340	1.000000	3.9799E-02	7.6488E-02	1.6344E-01
75	22.75593	6.9284E-02	.000214	1.000000	5.2496E-04	7.6488E-02	1.6344E-01
76	32.30893	7.3541E-02	.000000	1.000000	.0	7.6488E-02	1.6344E-01

MERGED JETMIX AND SSFD PROFILE
FOR X = 20.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.397688	1.000000	6.4667E-01	7.6488E-02	2.0517E-01
2	.08470	5.4558E-05	.397688	1.000000	6.4667E-01	7.6488E-02	2.0517E-01
3	.12160	1.1242E-04	.397477	1.000000	6.4718E-01	7.6488E-02	2.0517E-01
4	.15121	1.7380E-04	.397211	1.000000	6.4782E-01	7.6488E-02	2.0517E-01
5	.17731	2.3890E-04	.396909	1.000000	6.4853E-01	7.6488E-02	2.0517E-01
6	.20134	3.0794E-04	.396578	1.000000	6.4931E-01	7.6488E-02	2.0517E-01
7	.22405	3.8118E-04	.396219	1.000000	6.5015E-01	7.6488E-02	2.0517E-01
8	.24588	4.5885E-04	.395834	1.000000	6.5104E-01	7.6488E-02	2.0517E-01
9	.26711	5.4123E-04	.395421	1.000000	6.5199E-01	7.6488E-02	2.0517E-01
10	.28794	6.2861E-04	.394981	1.000000	6.5300E-01	7.6488E-02	2.0517E-01
11	.30853	7.2129E-04	.394512	1.000000	6.5407E-01	7.6488E-02	2.0517E-01
12	.32898	8.1959E-04	.394012	1.000000	6.5519E-01	7.6488E-02	2.0517E-01
13	.34939	9.2386E-04	.393481	1.000000	6.5637E-01	7.6488E-02	2.0517E-01
14	.36984	1.0344E-03	.392917	1.000000	6.5762E-01	7.6488E-02	2.0517E-01
15	.39039	1.1517E-03	.392318	1.000000	6.5893E-01	7.6488E-02	2.0517E-01
16	.41110	1.2761E-03	.391682	1.000000	6.6030E-01	7.6488E-02	2.0517E-01
17	.43201	1.4081E-03	.391007	1.000000	6.6174E-01	7.6488E-02	2.0517E-01
18	.45318	1.5480E-03	.390292	1.000000	6.6325E-01	7.6488E-02	2.0517E-01
19	.47463	1.6965E-03	.389534	1.000000	6.6482E-01	7.6488E-02	2.0517E-01
20	.49642	1.8539E-03	.388731	1.000000	6.6647E-01	7.6488E-02	2.0517E-01
21	.51858	2.0209E-03	.387880	1.000000	6.6818E-01	7.6488E-02	2.0517E-01
22	.54114	2.1980E-03	.386978	1.000000	6.6997E-01	7.6488E-02	2.0517E-01
23	.56414	2.3859E-03	.386023	1.000000	6.7183E-01	7.6488E-02	2.0517E-01
24	.58760	2.5851E-03	.385013	1.000000	6.7377E-01	7.6488E-02	2.0517E-01
25	.61158	2.7964E-03	.383943	1.000000	6.7577E-01	7.6488E-02	2.0517E-01
26	.63608	3.0206E-03	.382811	1.000000	6.7785E-01	7.6488E-02	2.0517E-01
27	.66116	3.2583E-03	.381614	1.000000	6.7999E-01	7.6488E-02	2.0517E-01
28	.68683	3.5105E-03	.380347	1.000000	6.8221E-01	7.6488E-02	2.0517E-01
29	.71315	3.7779E-03	.379007	1.000000	6.8448E-01	7.6488E-02	2.0517E-01
30	.74013	4.0616E-03	.377591	1.000000	6.8682E-01	7.6488E-02	2.0517E-01
31	.76782	4.3625E-03	.376093	1.000000	6.8922E-01	7.6488E-02	2.0517E-01
32	.79625	4.6816E-03	.374511	1.000000	6.9167E-01	7.6488E-02	2.0517E-01
33	.82540	5.0201E-03	.372838	1.000000	6.9416E-01	7.6488E-02	2.0517E-01
34	.85549	5.3791E-03	.371071	1.000000	6.9670E-01	7.6488E-02	2.0517E-01
35	.88637	5.7599E-03	.369204	1.000000	6.9926E-01	7.6488E-02	2.0517E-01
36	.91816	6.1637E-03	.367233	1.000000	7.0183E-01	7.6488E-02	2.0517E-01
37	.95089	6.5921E-03	.365151	1.000000	7.0441E-01	7.6488E-02	2.0517E-01
38	.98461	7.0464E-03	.362953	1.000000	7.0699E-01	7.6488E-02	2.0517E-01
39	1.01937	7.5283E-03	.360634	1.000000	7.0953E-01	7.6488E-02	2.0517E-01
40	1.05522	8.0394E-03	.358185	1.000000	7.1204E-01	7.6488E-02	2.0517E-01
41	1.09221	8.5815E-03	.355602	1.000000	7.1448E-01	7.6488E-02	2.0517E-01
42	1.13040	9.1565E-03	.352877	1.000000	7.1683E-01	7.6488E-02	2.0517E-01
43	1.16985	9.7663E-03	.350002	1.000000	7.1906E-01	7.6488E-02	2.0517E-01
44	1.21063	1.0413E-02	.346971	1.000000	7.2115E-01	7.6488E-02	2.0517E-01
45	1.25280	1.1099E-02	.343774	1.000000	7.2306E-01	7.6488E-02	2.0517E-01
46	1.29644	1.1827E-02	.340404	1.000000	7.2475E-01	7.6488E-02	2.0517E-01
47	1.34162	1.2599E-02	.336851	1.000000	7.2619E-01	7.6488E-02	2.0517E-01
48	1.38843	1.3417E-02	.333107	1.000000	7.2732E-01	7.6488E-02	2.0517E-01
49	1.43697	1.4286E-02	.329160	1.000000	7.2811E-01	7.6488E-02	2.0517E-01
50	1.48732	1.5206E-02	.325002	1.000000	7.2849E-01	7.6488E-02	2.0517E-01
51	1.53960	1.6183E-02	.320621	1.000000	7.2840E-01	7.6488E-02	2.0517E-01
52	1.59392	1.7219E-02	.316005	1.000000	7.2778E-01	7.6488E-02	2.0517E-01
53	1.65041	1.8318E-02	.311143	1.000000	7.2655E-01	7.6488E-02	2.0517E-01
54	1.70920	1.9483E-02	.306[illegible]0	1.000000	7.2464E-01	7.6488E-02	2.0517E-01

55	1.77045	2.0720E-02	.300624	1.000000	7.2197E-01	7.6488E-02	2.0517E-01
56	1.83433	2.2031E-02	.294940	1.000000	7.1844E-01	7.6488E-02	2.0517E-01
57	1.90102	2.3421E-02	.288953	1.000000	7.1394E-01	7.6488E-02	2.0517E-01
58	1.97074	2.4896E-02	.282645	1.000000	7.0838E-01	7.6488E-02	2.0517E-01
59	2.04371	2.6461E-02	.275999	1.000000	7.0163E-01	7.6488E-02	2.0517E-01
60	2.12020	2.8120E-02	.268995	1.000000	6.9357E-01	7.6488E-02	2.0517E-01
61	2.20050	2.9880E-02	.261614	1.000000	6.8406E-01	7.6488E-02	2.0517E-01
62	2.28496	3.1746E-02	.253831	1.000000	6.7296E-01	7.6488E-02	2.0517E-01
63	2.37397	3.3726E-02	.245624	1.000000	6.6011E-01	7.6488E-02	2.0517E-01
64	2.46800	3.5826E-02	.236964	1.000000	6.4533E-01	7.6488E-02	2.0517E-01
65	2.56757	3.8053E-02	.227822	1.000000	6.2846E-01	7.6488E-02	2.0517E-01
66	2.67332	4.0415E-02	.218164	1.000000	6.0928E-01	7.6488E-02	2.0517E-01
67	2.78604	4.2921E-02	.207953	1.000000	5.8760E-01	7.6488E-02	2.0517E-01
68	2.90665	4.5578E-02	.197143	1.000000	5.6319E-01	7.6488E-02	2.0517E-01
69	3.03635	4.8397E-02	.185685	1.000000	5.3580E-01	7.6488E-02	2.0517E-01
70	3.17662	5.1387E-02	.173516	1.000000	5.0515E-01	7.6488E-02	2.0517E-01
71	3.32943	5.4558E-02	.160561	1.000000	4.7095E-01	7.6488E-02	2.0517E-01
72	3.49746	5.7921E-02	.146724	1.000000	4.3285E-01	7.6488E-02	2.0517E-01
73	3.68445	6.1488E-02	.131875	1.000000	3.9043E-01	7.6488E-02	2.0517E-01
74	3.89609	6.5271E-02	.115826	1.000000	3.4314E-01	7.6488E-02	2.0517E-01
75	4.14163	6.9284E-02	.098277	1.000000	2.9018E-01	7.6488E-02	2.0517E-01
76	4.43853	7.3541E-02	.078656	1.000000	2.3013E-01	7.6488E-02	2.0517E-01
77	4.83020	7.8055E-02	.055430	1.000000	1.5861E-01	7.6488E-02	2.0517E-01
78	5.61396	8.2843E-02	.021124	1.000000	4.1858E-02	7.6488E-02	2.0517E-01
79	16.11482	8.7922E-02	.000598	1.000000	1.0907E-03	7.6488E-02	2.0517E-01
80	22.39856	9.3308E-02	.000000	1.000000	.0	7.6488E-02	2.0517E-01

MERGED JETMIX AND SBFD PROFILE
FOR X = 21.0000

	Y	PSI	UD	THD	ED	RHC	XLN
1	.00000	.0	.379569	1.000000	5.9436E-01	7.6488E-02	2.2336E-01
2	.08670	5.4558E-05	.379569	1.000000	5.9436E-01	7.6488E-02	2.2336E-01
3	.12446	1.1242E-04	.379377	1.000000	5.9479E-01	7.6488E-02	2.2336E-01
4	.15477	1.7380E-04	.379135	1.000000	5.9533E-01	7.6488E-02	2.2336E-01
5	.18149	2.3890E-04	.378861	1.000000	5.9595E-01	7.6488E-02	2.2336E-01
6	.20609	3.0794E-04	.378560	1.000000	5.9661E-01	7.6488E-02	2.2336E-01
7	.22933	3.8118E-04	.378234	1.000000	5.9733E-01	7.6488E-02	2.2336E-01
8	.25167	4.5885E-04	.377884	1.000000	5.9809E-01	7.6488E-02	2.2336E-01
9	.27339	5.4123E-04	.377509	1.000000	5.9891E-01	7.6488E-02	2.2336E-01
10	.29471	6.2861E-04	.377109	1.000000	5.9977E-01	7.6488E-02	2.2336E-01
11	.31578	7.2129E-04	.376682	1.000000	6.0068E-01	7.6488E-02	2.2336E-01
12	.33671	8.1959E-04	.376228	1.000000	6.0164E-01	7.6488E-02	2.2336E-01
13	.35759	9.2386E-04	.375745	1.000000	6.0265E-01	7.6488E-02	2.2336E-01
14	.37852	1.0344E-03	.375232	1.000000	6.0372E-01	7.6488E-02	2.2336E-01
15	.39954	1.1517E-03	.374687	1.000000	6.0484E-01	7.6488E-02	2.2336E-01
16	.42072	1.2761E-03	.374109	1.000000	6.0602E-01	7.6488E-02	2.2336E-01
17	.44212	1.4081E-03	.373496	1.000000	6.0726E-01	7.6488E-02	2.2336E-01
18	.46377	1.5480E-03	.372845	1.000000	6.0855E-01	7.6488E-02	2.2336E-01
19	.48572	1.6965E-03	.372155	1.000000	6.0991E-01	7.6488E-02	2.2336E-01
20	.50800	1.8539E-03	.371424	1.000000	6.1132E-01	7.6488E-02	2.2336E-01
21	.53066	2.0209E-03	.370650	1.000000	6.1280E-01	7.6488E-02	2.2336E-01
22	.55373	2.1980E-03	.369829	1.000000	6.1435E-01	7.6488E-02	2.2336E-01
23	.57725	2.3859E-03	.368960	1.000000	6.1595E-01	7.6488E-02	2.2336E-01
24	.60124	2.5851E-03	.368040	1.000000	6.1762E-01	7.6488E-02	2.2336E-01
25	.62575	2.7964E-03	.367066	1.000000	6.1936E-01	7.6488E-02	2.2336E-01
26	.65080	3.0206E-03	.366035	1.000000	6.2116E-01	7.6488E-02	2.2336E-01
27	.67643	3.2583E-03	.364944	1.000000	6.2302E-01	7.6488E-02	2.2336E-01
28	.70267	3.5105E-03	.363789	1.000000	6.2494E-01	7.6488E-02	2.2336E-01
29	.72956	3.7779E-03	.362568	1.000000	6.2692E-01	7.6488E-02	2.2336E-01
30	.75713	4.0616E-03	.361277	1.000000	6.2896E-01	7.6488E-02	2.2336E-01
31	.78542	4.3625E-03	.359912	1.000080	6.3106E-01	7.6488E-02	2.2336E-01
32	.81446	4.6816E-03	.358468	1.000000	6.3320E-01	7.6488E-02	2.2336E-01
33	.84429	5.0201E-03	.356942	1.000000	6.3539E-01	7.6488E-02	2.2336E-01
34	.87496	5.3791E-03	.355330	1.000000	6.3762E-01	7.6488E-02	2.2336E-01
35	.90649	5.7599E-03	.353627	1.000000	6.3987E-01	7.6488E-02	2.2336E-01
36	.93894	6.1637E-03	.351827	1.000000	6.4215E-01	7.6488E-02	2.2336E-01
37	.97234	6.5921E-03	.349926	1.000000	6.4444E-01	7.6488E-02	2.2336E-01
38	1.00675	7.0464E-03	.347919	1.000000	6.4674E-01	7.6488E-02	2.2336E-01
39	1.04221	7.5283E-03	.345800	1.000000	6.4902E-01	7.6488E-02	2.2336E-01
40	1.07877	8.0394E-03	.343563	1.000000	6.5127E-01	7.6488E-02	2.2336E-01
41	1.11649	8.5815E-03	.341202	1.000000	6.5348E-01	7.6488E-02	2.2336E-01
42	1.15542	9.1565E-03	.338710	1.000000	6.5562E-01	7.6488E-02	2.2336E-01
43	1.19563	9.7663E-03	.336081	1.000000	6.5768E-01	7.6488E-02	2.2336E-01
44	1.23717	1.0413E-02	.333308	1.000000	6.5962E-01	7.6488E-02	2.2336E-01
45	1.28012	1.1099E-02	.330384	1.000000	6.6143E-01	7.6488E-02	2.2336E-01
46	1.32455	1.1827E-02	.327299	1.000000	6.6306E-01	7.6488E-02	2.2336E-01
47	1.37054	1.2599E-02	.324048	1.000000	6.6449E-01	7.6488E-02	2.2336E-01
48	1.41816	1.3417E-02	.320619	1.000000	6.6568E-01	7.6488E-02	2.2336E-01
49	1.46752	1.4286E-02	.317005	1.000000	6.6659E-01	7.6488E-02	2.2336E-01
50	1.51870	1.5206E-02	.313197	1.000000	6.6716E-01	7.6488E-02	2.2336E-01

51	1.57182	1.6183E-02	.309183	1.000000	6.6735E-01	7.6488E-02	2.2336E-01
52	1.62698	1.7219E-02	.304953	1.000000	6.6710E-01	7.6488E-02	2.2336E-01
53	1.68430	1.8318E-02	.300496	1.000000	6.6635E-01	7.6488E-02	2.2336E-01
54	1.74394	1.9483E-02	.295801	1.000000	6.6504E-01	7.6488E-02	2.2336E-01
55	1.80602	2.0720E-02	.290854	1.000000	6.6309E-01	7.6488E-02	2.2336E-01
56	1.87072	2.2031E-02	.285642	1.000000	6.6042E-01	7.6488E-02	2.2336E-01
57	1.93822	2.3421E-02	.280151	1.000000	6.5694E-01	7.6488E-02	2.2336E-01
58	2.00871	2.4896E-02	.274366	1.000000	6.5257E-01	7.6488E-02	2.2336E-01
59	2.08242	2.6461E-02	.268270	1.000000	6.4720E-01	7.6488E-02	2.2336E-01
60	2.15961	2.8120E-02	.261846	1.000000	6.4071E-01	7.6488E-02	2.2336E-01
61	2.24055	2.9880E-02	.255076	1.000000	6.3301E-01	7.6488E-02	2.2336E-01
62	2.32557	3.1746E-02	.247939	1.000000	6.2394E-01	7.6488E-02	2.2336E-01
63	2.41503	3.3726E-02	.240413	1.000000	6.1339E-01	7.6488E-02	2.2336E-01
64	2.50937	3.5826E-02	.232473	1.000000	6.0120E-01	7.6488E-02	2.2336E-01
65	2.60909	3.8053E-02	.224094	1.000000	5.8722E-01	7.6488E-02	2.2336E-01
66	2.71476	4.0415E-02	.215246	1.000000	5.7127E-01	7.6488E-02	2.2336E-01
67	2.82710	4.2921E-02	.205895	1.000000	5.5317E-01	7.6488E-02	2.2336E-01
68	2.94695	4.5578E-02	.196004	1.000000	5.3272E-01	7.6488E-02	2.2336E-01
69	3.07535	4.8397E-02	.185529	1.000000	5.0972E-01	7.6488E-02	2.2336E-01
70	3.21362	5.1387E-02	.174419	1.000000	4.8392E-01	7.6488E-02	2.2336E-01
71	3.36342	5.4558E-02	.162611	1.000000	4.5508E-01	7.6488E-02	2.2336E-01
72	3.52697	5.7921E-02	.150029	1.000000	4.2290E-01	7.6488E-02	2.2336E-01
73	3.70732	6.1488E-02	.136573	1.000000	3.8705E-01	7.6488E-02	2.2336E-01
74	3.90881	6.5271E-02	.122109	1.000000	3.4710E-01	7.6488E-02	2.2336E-01
75	4.13810	6.9284E-02	.106441	1.000000	3.0247E-01	7.6488E-02	2.2336E-01
76	4.40641	7.3541E-02	.089250	1.000000	2.5223E-01	7.6488E-02	2.2336E-01
77	4.73579	7.8055E-02	.069903	1.000000	1.9445E-01	7.6488E-02	2.2336E-01
78	5.18826	8.2843E-02	.046383	1.000000	1.2196E-01	7.6488E-02	2.2336E-01
79	6.45407	8.7922E-02	.011184	1.000000	1.9521E-02	7.6488E-02	2.2336E-01
80	56.11994	9.3308E-02	.000046	1.000000	5.6767E-05	7.6488E-02	2.2336E-01
81	80.28519	9.9022E-02	.000000	1.000000	.0	7.6488E-02	2.2336E-01

MERGED JETMIX AND SSFD PROFILE
FOR X = 32.0000

	Y	PSI	UD	THD	ED	RHO	XLN
1	.00000	.0	.252915	1.000000	2.7090E-01	7.6488E-02	3.2675E-01
2	.14309	9.9022E-05	.252915	1.000000	2.7090E-01	7.6488E-02	3.2675E-01
3	.20542	2.0405E-04	.252761	1.000000	2.7112E-01	7.6488E-02	3.2675E-01
4	.25545	3.1544E-04	.252565	1.000000	2.7139E-01	7.6488E-02	3.2675E-01
5	.29955	4.3360E-04	.252344	1.000000	2.7169E-01	7.6488E-02	3.2675E-01
6	.34017	5.5891E-04	.252102	1.000000	2.7202E-01	7.6488E-02	3.2675E-01
7	.37855	6.9183E-04	.251839	1.000000	2.7238E-01	7.6488E-02	3.2675E-01
8	.41544	8.3281E-04	.251557	1.000000	2.7276E-01	7.6488E-02	3.2675E-01
9	.45133	9.8233E-04	.251255	1.000000	2.7316E-01	7.6488E-02	3.2675E-01
10	.48654	1.1409E-03	.250932	1.000000	2.7359E-01	7.6488E-02	3.2675E-01
11	.52135	1.3091E-03	.250589	1.000000	2.7404E-01	7.6488E-02	3.2675E-01
12	.55594	1.4876E-03	.250223	1.000000	2.7451E-01	7.6488E-02	3.2675E-01
13	.59046	1.6768E-03	.249834	1.000000	2.7501E-01	7.6488E-02	3.2675E-01
14	.62506	1.8775E-03	.249421	1.000000	2.7553E-01	7.6488E-02	3.2675E-01
15	.65983	2.0904E-03	.248982	1.000000	2.7608E-01	7.6488E-02	3.2675E-01
16	.69487	2.3162E-03	.248517	1.000000	2.7665E-01	7.6488E-02	3.2675E-01
17	.73026	2.5557E-03	.248023	1.000000	2.7725E-01	7.6488E-02	3.2675E-01
18	.76609	2.8097E-03	.247499	1.000000	2.7788E-01	7.6488E-02	3.2675E-01
19	.80243	3.0791E-03	.246944	1.000000	2.7853E-01	7.6488E-02	3.2675E-01
20	.83933	3.3648E-03	.246356	1.000000	2.7921E-01	7.6488E-02	3.2675E-01
21	.87687	3.6679E-03	.245733	1.000000	2.7992E-01	7.6488E-02	3.2675E-01
22	.91509	3.9894E-03	.245073	1.000000	2.8065E-01	7.6488E-02	3.2675E-01
23	.95407	4.3303E-03	.244375	1.000000	2.8141E-01	7.6488E-02	3.2673E-01
24	.99386	4.6920E-03	.243635	1.000000	2.8220E-01	7.6488E-02	3.2675E-01
25	1.03452	5.0755E-03	.242852	1.000000	2.8301E-01	7.6488E-02	3.2675E-01
26	1.07610	5.4824E-03	.242024	1.000000	2.8385E-01	7.6488E-02	3.2675E-01
27	1.11866	5.9139E-03	.241147	1.000000	2.8471E-01	7.6488E-02	3.2675E-01
28	1.16225	6.3715E-03	.240220	1.000000	2.8559E-01	7.6488E-02	3.2675E-01
29	1.20695	6.8569E-03	.239240	1.000000	2.8649E-01	7.6488E-02	3.2675E-01
30	1.25280	7.3718E-03	.238203	1.000000	2.8741E-01	7.6488E-02	3.2675E-01
31	1.29988	7.9179E-03	.237108	1.000000	2.8835E-01	7.6488E-02	3.2675E-01
32	1.34824	8.4971E-03	.235949	1.000000	2.8929E-01	7.6488E-02	3.2675E-01
33	1.39795	9.1114E-03	.234726	1.000000	2.9024E-01	7.6488E-02	3.2675E-01
34	1.44908	9.7630E-03	.233433	1.000000	2.9120E-01	7.6488E-02	3.2675E-01
35	1.50170	1.0454E-02	.232067	1.000000	2.9215E-01	7.6488E-02	3.2675E-01
36	1.55589	1.1187E-02	.230624	1.000000	2.9309E-01	7.6488E-02	3.2675E-01
37	1.61173	1.1965E-02	.229101	1.000000	2.9401E-01	7.6488E-02	3.2675E-01
38	1.66931	1.2789E-02	.227493	1.000000	2.9491E-01	7.6488E-02	3.2675E-01
39	1.72870	1.3664E-02	.225795	1.000000	2.9578E-01	7.6488E-02	3.2675E-01
40	1.79000	1.4591E-02	.224003	1.000000	2.9661E-01	7.6488E-02	3.2675E-01
41	1.85332	1.5575E-02	.222113	1.000000	2.9737E-01	7.6488E-02	3.2675E-01
42	1.91875	1.6619E-02	.220118	1.000000	2.9808E-01	7.6488E-02	3.2675E-01
43	1.98642	1.7726E-02	.218014	1.000000	2.9870E-01	7.6488E-02	3.2675E-01
44	2.05643	1.8900E-02	.215794	1.000000	2.9922E-01	7.6488E-02	3.2675E-01
45	2.12893	2.0145E-02	.213454	1.000000	2.9962E-01	7.6488E-02	3.2675E-01
46	2.20404	2.1466E-02	.210985	1.000000	2.9989E-01	7.6488E-02	3.2675E-01
47	2.28192	2.2867E-02	.208383	1.000000	3.0000E-01	7.6488E-02	3.2675E-01
48	2.36274	2.4352E-02	.205640	1.000000	2.9994E-01	7.6488E-02	3.2675E-01
49	2.44666	2.5928E-02	.202748	1.000000	2.9966E-01	7.6488E-02	3.2675E-01
50	2.53388	2.7600E-02	.199699	1.000000	2.9915E-01	7.6488E-02	3.2675E-01
51	2.62461	2.9372E-02	.196486	1.000000	2.9838E-01	7.6488E-02	3.2675E-01
52	2.71909	3.1253E-02	.193100	1.000000	2.9730E-01	7.6488E-02	3.2675E-01

53	2.81756	3.3247E-02	.189530	1.000000	2.9589E-01	7.6488E-02	3.2675E-01
54	2.92031	3.5362E-02	.185768	1.000000	2.9410E-01	7.6488E-02	3.2675E-01
55	3.02765	3.7606E-02	.181803	1.000000	2.9189E-01	7.6488E-02	3.2675E-01
56	3.13994	3.9985E-02	.177623	1.000000	2.8921E-01	7.6488E-02	3.2675E-01
57	3.25757	4.2509E-02	.173216	1.000000	2.8601E-01	7.6488E-02	3.2675E-01
58	3.38100	4.5186E-02	.168568	1.000000	2.8224E-01	7.6488E-02	3.2675E-01
59	3.51072	4.8026E-02	.163667	1.000000	2.7783E-01	7.6488E-02	3.2675E-01
60	3.64735	5.1037E-02	.158494	1.000000	2.7272E-01	7.6488E-02	3.2675E-01
61	3.79155	5.4231E-02	.153035	1.000000	2.6684E-01	7.6488E-02	3.2675E-01
62	3.94414	5.7619E-02	.147269	1.000000	2.6012E-01	7.6488E-02	3.2675E-01
63	4.10607	6.1213E-02	.141176	1.000000	2.5248E-01	7.6488E-02	3.2675E-01
64	4.27848	6.5024E-02	.134730	1.000000	2.4383E-01	7.6488E-02	3.2675E-01
65	4.46277	6.9066E-02	.127906	1.000000	2.3407E-01	7.6488E-02	3.2675E-01
66	4.66067	7.3354E-02	.120670	1.000000	2.2310E-01	7.6488E-02	3.2675E-01
67	4.87439	7.7901E-02	.112984	1.000000	2.1082E-01	7.6488E-02	3.2675E-01
68	5.10680	8.2725E-02	.104801	1.000000	1.9710E-01	7.6488E-02	3.2675E-01
69	5.36175	8.7840E-02	.096061	1.000000	1.8180E-01	7.6488E-02	3.2675E-01
70	5.64465	9.3266E-02	.086684	1.000000	1.6474E-01	7.6488E-02	3.2675E-01
71	5.96354	9.9022E-02	.076557	1.000000	1.4574E-01	7.6488E-02	3.2675E-01
72	6.33131	1.0513E-01	.065499	1.000000	1.2447E-01	7.6488E-02	3.2675E-01
73	6.77149	1.1160E-01	.053186	1.000000	1.0043E-01	7.6488E-02	3.2675E-01
74	7.33830	1.1847E-01	.038853	1.000000	7.2057E-02	7.6488E-02	3.2675E-01
75	8.29347	1.2575E-01	.018989	1.000000	2.7019E-02	7.6488E-02	3.2675E-01
76	16.66649	1.3348E-01	.001018	1.000000	1.1927E-03	7.6488E-02	3.2675E-01
77	22.34807	1.4167E-01	.000000	1.000000	.0	7.6488E-02	3.2675E-01

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EXECUTING PROGM=NOISE
TAPIN= T      TAPOT= F
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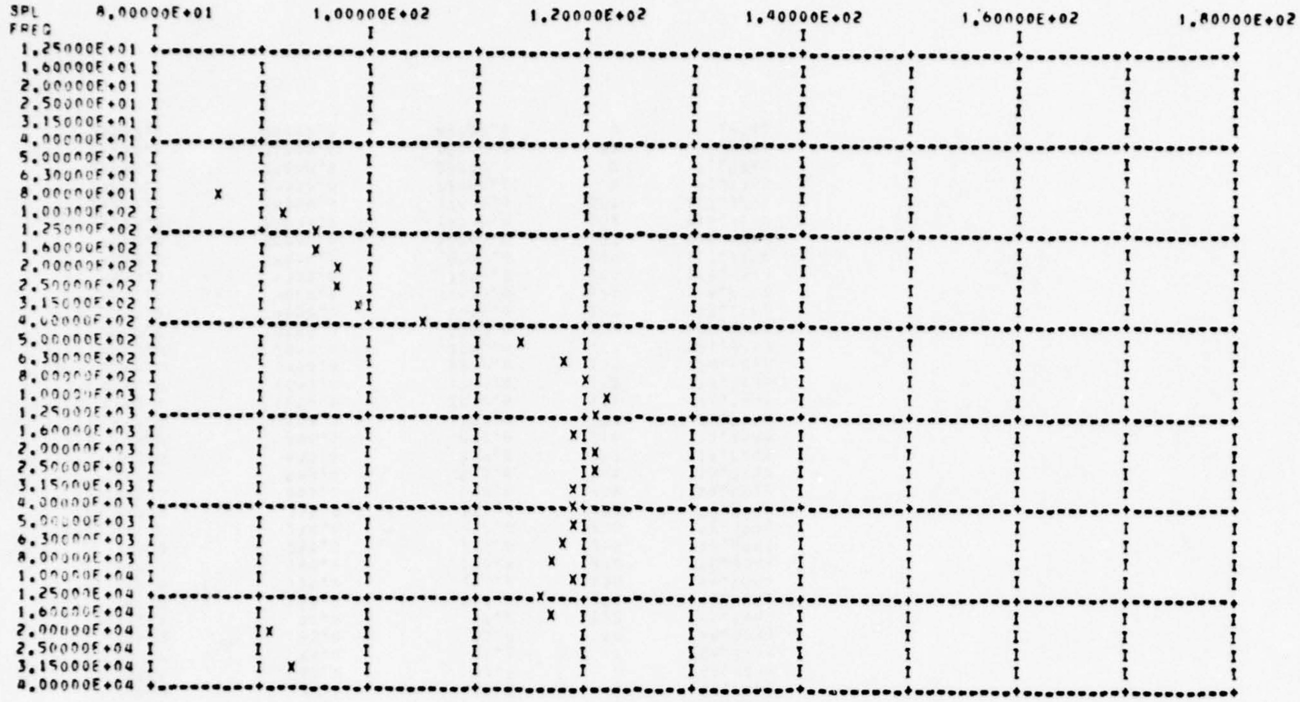
1/3 OCTAVE BAND ANALYSIS

X/D = 109.930   Y/D = 19.384   R/D = 111.626
SIDELINE DISTANCE= 6.95   ANGLE= 10.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	25.4131
22.4	25.0	28.2	1	32.1034
28.2	31.5	35.5	6	38.8825
35.5	40.0	44.7	6	42.6239
44.7	50.0	56.3	11	56.8428
56.3	63.0	70.9	18	68.3333
70.9	80.0	89.2	122	85.7403
89.2	100.0	112.0	153	92.4380
112.0	125.0	141.0	134	94.5554
141.0	160.0	178.0	214	95.3346
178.0	200.0	224.0	213	96.6929
224.0	250.0	282.0	230	97.3926
282.0	315.0	355.0	198	99.3452
355.0	400.0	447.0	244	104.5811
447.0	500.0	563.0	364	113.5737
563.0	630.0	709.0	232	118.0241
709.0	800.0	892.0	210	120.4689
892.0	1000.0	1120.0	187	121.5880
1120.0	1250.0	1410.0	121	121.1404
1410.0	1600.0	1780.0	152	119.3636
1780.0	2000.0	2240.0	115	120.6012
2240.0	2500.0	2820.0	117	121.2703
2820.0	3150.0	3550.0	175	119.0853
3550.0	4000.0	4470.0	147	119.2701
4470.0	5000.0	5630.0	128	118.9707
5630.0	6300.0	7090.0	105	118.3572
7090.0	8000.0	8920.0	129	117.2152
8920.0	10000.0	11200.0	137	118.6064
11200.0	12500.0	14100.0	102	116.3648
14100.0	16000.0	17800.0	387	117.3294
17800.0	20000.0	22400.0	8	91.1366
22400.0	25000.0	28200.0	2	71.9842
28200.0	31500.0	35500.0	32	93.2671
35500.0	40000.0	44700.0	0	.0000

SPL VS. FREQ.

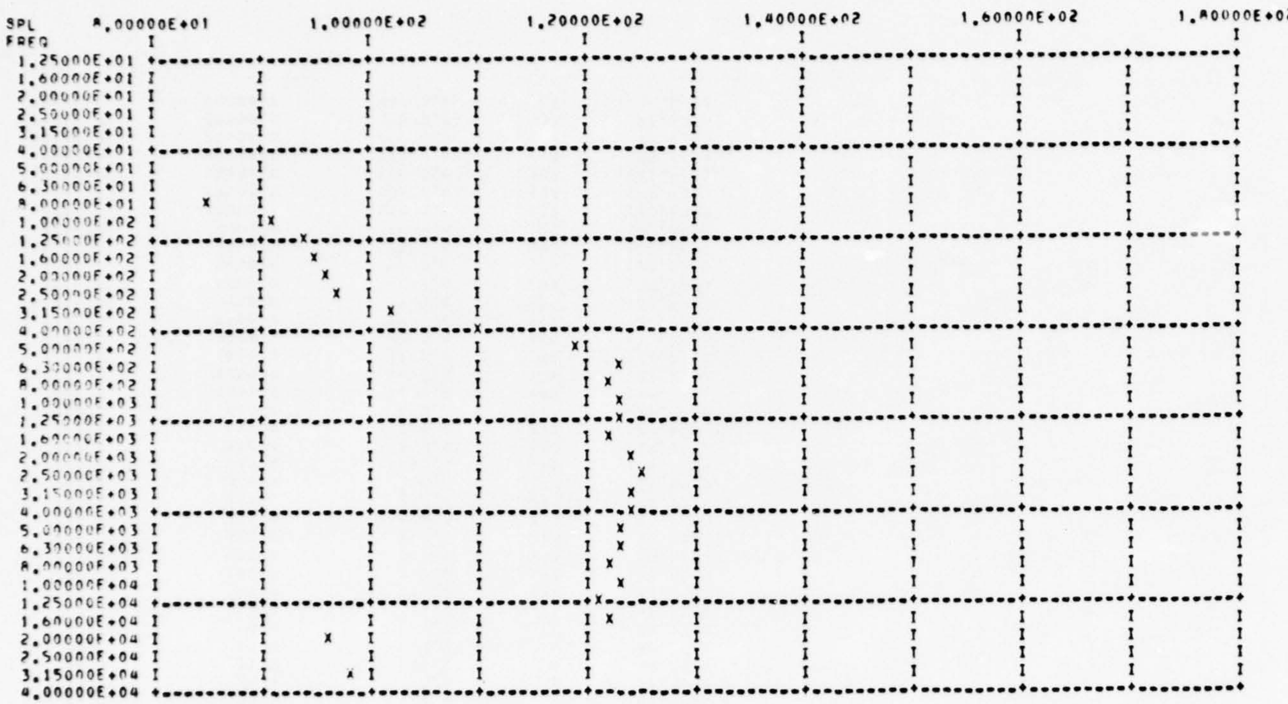

SPL
FREQ
8.00000E+01
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = 104.890   Y/D = 38.178   R/D = 111.626
SIDELINE DISTANCE= 13.68   ANGLE= 20.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	24.7466
22.4	25.0	28.2	1	31.4652
28.2	31.5	35.5	6	38.2971
35.5	40.0	44.7	6	41.9771
44.7	50.0	56.3	11	56.1315
56.3	63.0	70.9	18	67.5532
70.9	80.0	89.2	122	84.7154
89.2	100.0	112.0	153	91.4515
112.0	125.0	141.0	134	93.6187
141.0	160.0	178.0	214	94.6022
178.0	200.0	224.0	213	96.2632
224.0	250.0	282.0	230	96.9215
282.0	315.0	355.0	198	101.5919
355.0	400.0	447.0	244	109.9775
447.0	500.0	563.0	364	119.0058
563.0	630.0	709.0	232	122.6985
709.0	800.0	892.0	210	122.3658
892.0	1000.0	1120.0	187	123.4771
1120.0	1250.0	1410.0	121	123.2342
1410.0	1600.0	1780.0	152	122.2717
1780.0	2000.0	2240.0	115	123.5128
2240.0	2500.0	2820.0	117	124.5827
2820.0	3150.0	3550.0	175	123.5027
3550.0	4000.0	4470.0	147	123.7039
4470.0	5000.0	5630.0	128	123.4219
5630.0	6300.0	7090.0	105	122.8121
7090.0	8000.0	8920.0	129	121.8498
8920.0	10000.0	11200.0	137	123.1999
11200.0	12500.0	14100.0	102	120.7023
14100.0	16000.0	17800.0	387	121.9681
17800.0	20000.0	22400.0	8	95.7664
22400.0	25000.0	28200.0	2	76.8243
28200.0	31500.0	35500.0	32	97.9876
35500.0	40000.0	44700.0	0	.0000

SPL VS. FREQ.

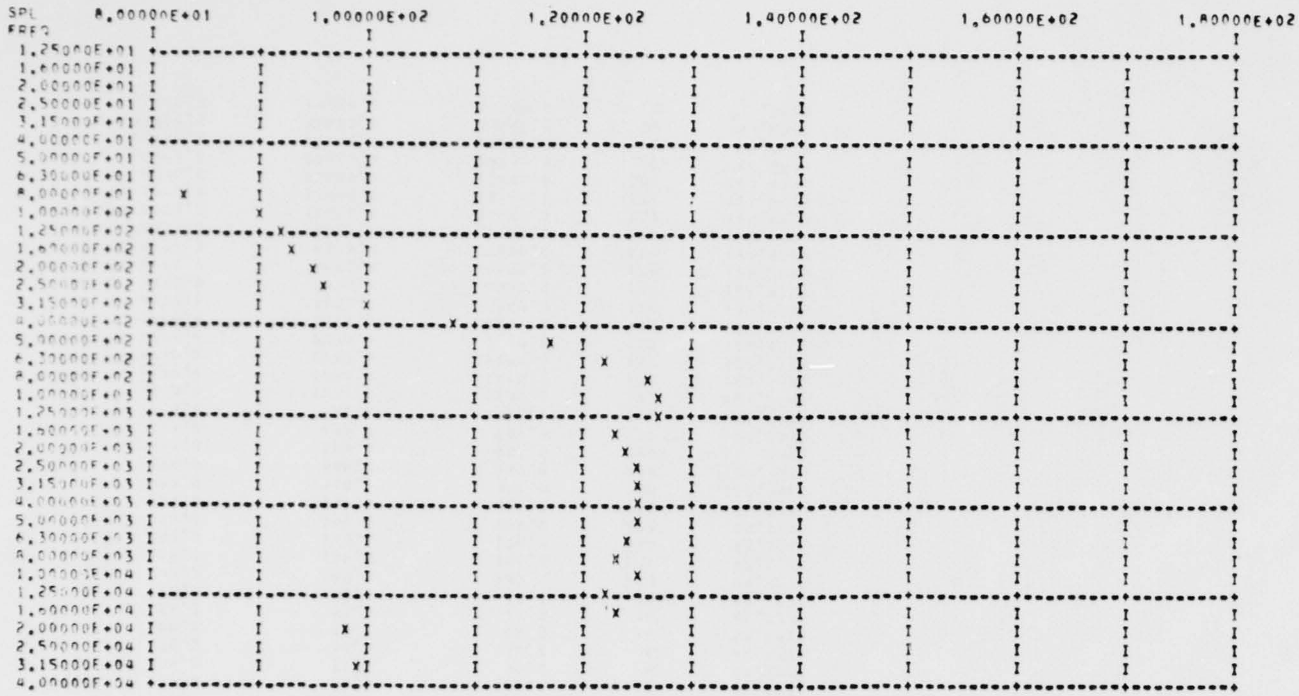

SPL
FREQ
8.00000E+01
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = 96.671 Y/D = 55.813 R/D = 111.626
SIDELINE DISTANCE= 20.00 ANGLE= 30.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	23.5329
22.4	25.0	28.2	1	30.3091
28.2	31.5	35.5	6	37.2408
35.5	40.0	44.7	6	40.8296
44.7	50.0	56.3	11	54.8915
56.3	63.0	70.9	18	66.2271
70.9	80.0	89.2	122	83.0930
89.2	100.0	112.0	153	89.8827
112.0	125.0	141.0	134	92.1206
141.0	160.0	178.0	214	93.3954
178.0	200.0	224.0	213	95.4390
224.0	250.0	282.0	230	96.0404
282.0	315.0	355.0	198	100.1664
355.0	400.0	447.0	244	108.1503
447.0	500.0	563.0	364	116.8696
563.0	630.0	709.0	232	122.2035
709.0	800.0	892.0	210	125.9183
892.0	1000.0	1120.0	187	127.2141
1120.0	1250.0	1410.0	121	126.5426
1410.0	1600.0	1780.0	152	122.9738
1780.0	2000.0	2240.0	115	124.2511
2240.0	2500.0	2820.0	117	125.4966
2820.0	3150.0	3550.0	175	124.7546
3550.0	4000.0	4470.0	147	124.9387
4470.0	5000.0	5630.0	128	124.7084
5630.0	6300.0	7090.0	105	124.0664
7090.0	8000.0	8920.0	129	123.2826
8920.0	10000.0	11200.0	137	124.6017
11200.0	12500.0	14100.0	102	121.8477
14100.0	16000.0	17800.0	387	123.4076
17800.0	20000.0	22400.0	8	97.5783
22400.0	25000.0	28200.0	2	78.9538
28200.0	31500.0	35500.0	32	99.4969
35500.0	40000.0	44700.0	0	.0000

SPL VS. FREQ.


SPL
FREQ
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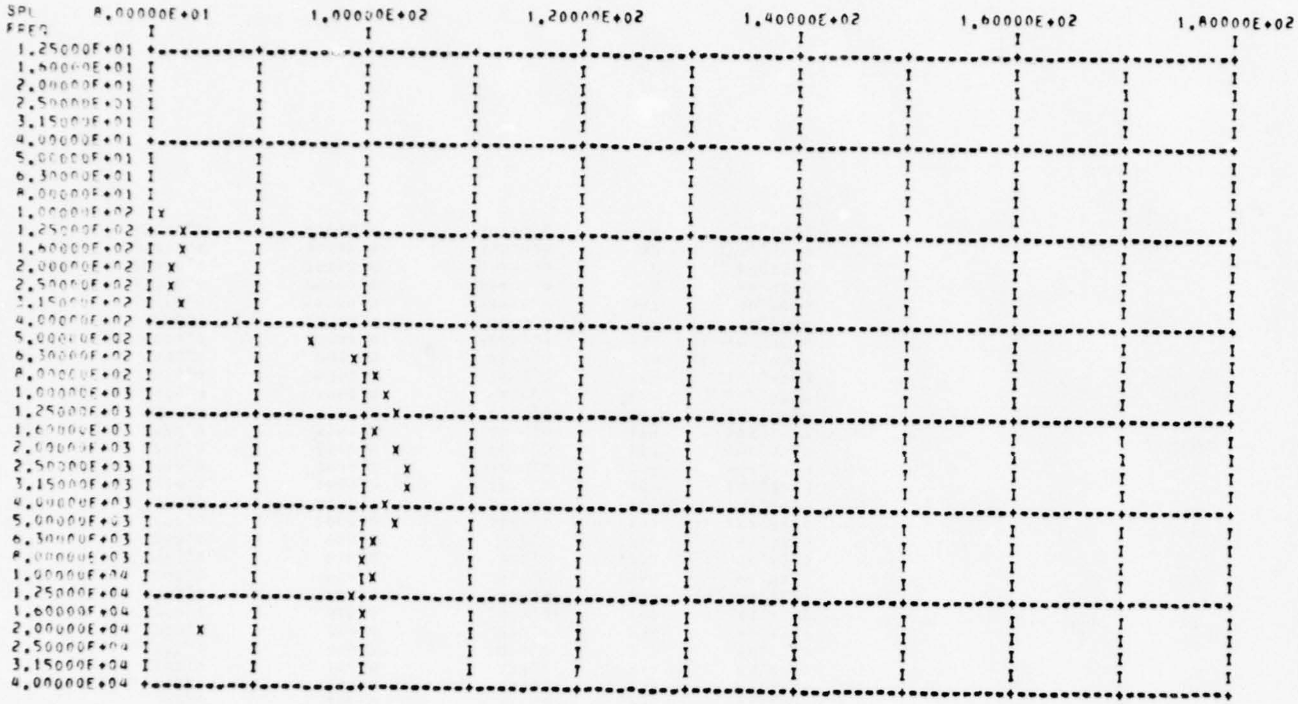
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = -96.680 Y/D = 55.818 R/D = 111.636
SIDELINE DISTANCE= 20.00 ANGLE= 150.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	19.2028
22.4	25.0	28.2	1	26.1171
28.2	31.5	35.5	6	33.3737
35.5	40.0	44.7	6	36.6196
44.7	50.0	56.3	11	49.9513
56.3	63.0	70.9	18	60.5118
70.9	80.0	89.2	122	74.9051
89.2	100.0	112.0	153	81.2333
112.0	125.0	141.0	134	83.1936
141.0	160.0	178.0	214	83.0261
178.0	200.0	224.0	213	82.4530
224.0	250.0	282.0	230	82.1997
282.0	315.0	355.0	198	83.2790
355.0	400.0	447.0	244	88.3607
447.0	500.0	563.0	364	95.0448
563.0	630.0	709.0	232	96.8320
709.0	800.0	892.0	210	101.3319
892.0	1000.0	1120.0	187	102.2410
1120.0	1250.0	1410.0	121	103.0855
1410.0	1600.0	1790.0	152	101.3243
1780.0	2000.0	2240.0	115	103.1379
2240.0	2500.0	2820.0	117	104.3268
2820.0	3150.0	3550.0	175	103.5527
3550.0	4000.0	4470.0	147	102.0969
4470.0	5000.0	5630.0	128	102.8772
5630.0	6300.0	7090.0	105	101.4463
7090.0	8000.0	8920.0	129	100.0818
8920.0	10000.0	11200.0	137	101.1514
11200.0	12500.0	14100.0	102	99.3008
14100.0	16000.0	17800.0	387	99.9026
17800.0	20000.0	22400.0	8	84.9830
22400.0	25000.0	28200.0	2	69.7308
28200.0	31500.0	35500.0	32	78.6699
35500.0	40000.0	44700.0	0	.0000

SPL VS. FREQ.

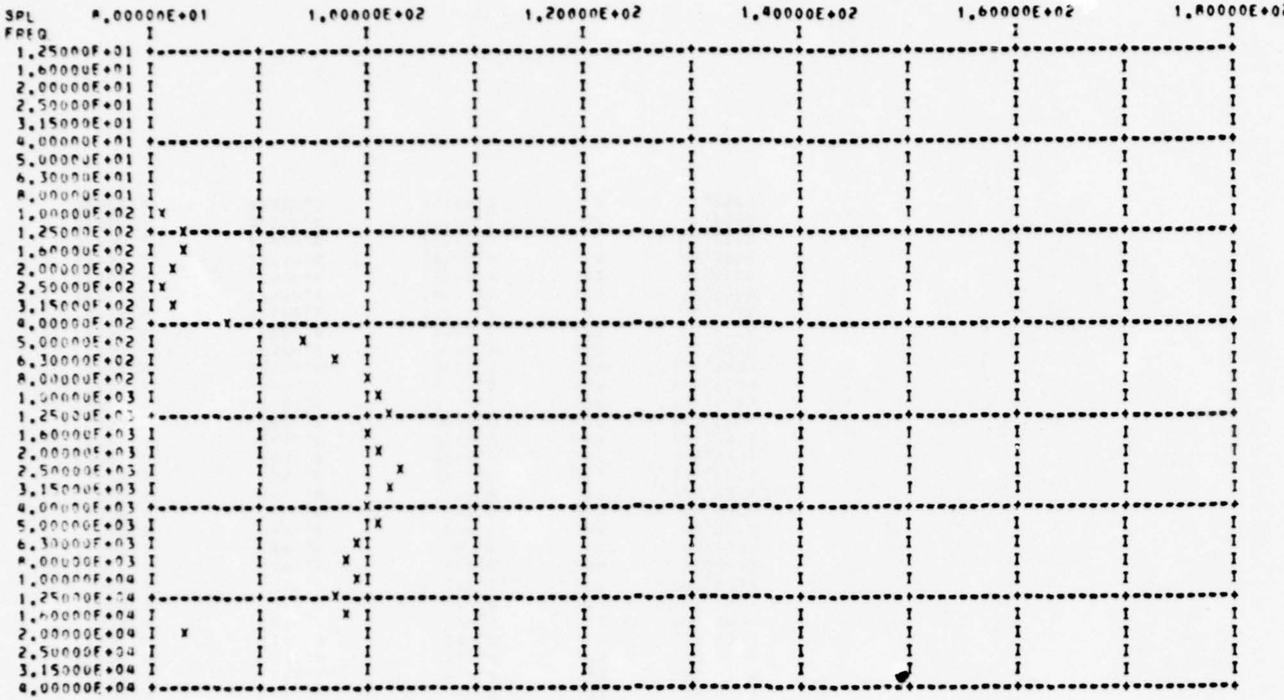

SPL
FREQ
8.00000E+01
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = -104.909 Y/D = 38.184 R/D = 111.642
SIDELINE DISTANCE= 13.68 ANGLE= 160.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	,0000
14.1	16.0	17.8	3	,0000
17.8	20.0	22.4	7	19,2872
22.4	25.0	28.2	1	26,2144
28.2	31.5	35.5	6	33,4954
35.5	40.0	44.7	6	36,7346
44.7	50.0	56.3	11	50,0479
56.3	63.0	70.9	18	60,6008
70.9	80.0	89.2	122	74,9769
89.2	100.0	112.0	153	81,3118
112.0	125.0	141.0	134	83,2836
141.0	160.0	178.0	214	82,9328
178.0	200.0	224.0	213	81,6638
224.0	250.0	282.0	230	81,2641
282.0	315.0	355.0	198	82,0713
355.0	400.0	447.0	244	87,0624
447.0	500.0	563.0	364	93,6520
563.0	630.0	709.0	232	97,3674
709.0	800.0	892.0	210	99,8230
892.0	1000.0	1120.0	187	100,7034
1120.0	1250.0	1410.0	121	101,5258
1410.0	1600.0	1780.0	152	99,5751
1780.0	2000.0	2240.0	115	101,3973
2240.0	2500.0	2820.0	117	102,5344
2820.0	3150.0	3550.0	175	101,6526
3550.0	4000.0	4470.0	147	100,1129
4470.0	5000.0	5630.0	128	100,9434
5630.0	6300.0	7090.0	105	99,4775
7090.0	8000.0	8920.0	129	98,0953
8920.0	10000.0	11200.0	137	99,1316
11200.0	12500.0	14100.0	102	97,3069
14100.0	16000.0	17800.0	387	97,8888
17800.0	20000.0	22400.0	8	83,3951
22400.0	25000.0	28200.0	2	68,2909
28200.0	31500.0	35500.0	32	77,0008
35500.0	40000.0	44700.0	0	,0000

SPL VS. FREQ.


SPL
FREQ
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1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

* J E T   A N A L Y S I S   P R O G R A M *

* S U M M A R Y   A C O U S T I C   A N A L Y S I S *

SELF + SHEAR NOISE FAR FIELD MODEL

```
                    *  AERODYNAMIC PARAMETERS  *

EXTERNAL CONDITIONS   JET DISCHARGE PARAMETERS     GAS PROPERTIES

                                                  GAM   =        1.40000
TF  =      518.700    DIAJ  =       8.30000       RG    =       53.34000
PF  =  1.4696E+01     MJET  =        1.5590       PR    =         .72000
VF  =         .000    TJET  =       518.700       PRT   =        1.00000
MF  =        .0000    PTJET=     5.8798E+01       SC    =*00000000.000
TIE=     .0           VJET  =      1740.393       TREF  =*00000000.000
                      TIJET=     1.0000E-01       MUREF=     1.0000E+15
```

```
                        * FAR FIELD NOISE PARAMETERS *

                     REFERENCE PRESSURE(PREFN)=          2.00000000E-04
                     AMBIENT SONIC VELOCITY(ASPEED)=          1116.35
                     SIDE-LINE DISTANCE (SLINE)=              13.6826

N  ANGLE,DEG.   SOUND PRES.   OASPL,DB    PNDB, DB                        OCTAVE CENTER FREQ(HZ)-SPLS
                                                      (63)    (125)   (250)   (500)   (1000)  (2000)  (4000)  (8000)
                                                    ******* ******* ******* ******* ******* ******* ******* *******
```

1	10.00000	5.393776E+05	131.2983	142.6686	85.824	99.043	102.731	119.498	125.861	125.253	123.882	122.872
2	20.00000	1.228967E+06	134.8748	146.1779	84.804	98.184	103.725	124.403	127.823	128.328	128.316	127.428
3	30.00000	1.778941E+06	136.4810	147.3853	83.188	96.802	102.530	123.449	131.362	129.133	129.573	128.788
4	150.00000	9.548702E+03	113.7788	125.7626	75.074	87.342	87.440	100.616	107.049	107.871	107.654	105.703
5	160.00000	6.331363E+03	111.9944	123.9917	75.146	87.362	86.450	99.181	105.511	106.105	105.719	103.711

** SUMMARY ACOUSTIC POWER ANALYSIS **

TOTAL ACOUSTIC POWER OUTPUT OF JET= 167.653387 (PWL),DB

POWER OUTPUT PER JET RADIUS LENGTH

X	POWER	X	POWER	X	POWER	X	POWER
.00000	169.159861	.00010	166.042587	.00020	166.038542	.00030	166.034918
.00050	166.027846	.00080	166.017262	.00100	166.010150	.00200	165.974235
.00400	164.962070	.00600	164.889668	.00800	165.222927	.01000	165.438553
.01500	165.588612	.01700	165.549685	.02000	165.305325	.04000	163.553733
.06000	163.354184	.08000	163.057874	.10000	162.318485	.12000	161.604838
.20000	161.037473	.25000	161.060216	.30000	160.139916	.34000	159.487268
.40000	159.095341	.45000	158.689230	.50000	158.193010	.55000	157.838948
.60000	157.860284	.65000	157.306577	.70000	157.172705	.80000	158.936836
1.00000	156.634093	1.20000	155.801973	1.50000	155.194950	1.70000	156.001363
2.00000	155.800043	2.50000	155.869802	3.00000	154.925932	3.40000	153.213759
4.00000	153.169627	4.12865	153.032695	5.00000	153.397315	6.00000	153.383317
6.20000	152.764218	6.50000	152.262620	6.80000	152.286436	7.00000	151.241450
7.50000	151.081844	8.00000	150.319082	9.00000	148.795261	10.00000	146.574992
11.00000	143.958839	12.00000	141.469253	12.12730	141.404641	13.00000	137.492534
14.00000	135.223799	15.00000	131.684054	16.00000	129.520354	17.00000	125.634222
18.00000	124.000986	19.00000	123.850576	20.00000	124.402689	21.00000	122.957598
22.00000	124.805451	23.00000	123.733985	24.00000	122.228115	25.00000	119.059755
26.00000	118.200112	28.00000	117.585405	30.00000	117.797325	32.00000	115.384959
34.00000	113.565204	36.00000	111.814906				

1/3-OCTAVE BAND POWER SPECTRUM

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	POWER
11.2	12.5	14.1	1	.000000
14.1	16.0	17.8	3	.000000
17.8	20.0	22.4	7	59.016554
22.4	25.0	28.2	1	65.887768
28.2	31.5	35.5	6	73.012400
35.5	40.0	44.7	6	76.436737
44.7	50.0	56.3	11	90.204398
56.3	63.0	70.9	18	101.271071
70.9	80.0	89.2	122	117.492111
89.2	100.0	112.0	153	124.209279
112.0	125.0	141.0	134	126.418320
141.0	160.0	178.0	214	128.539481
178.0	200.0	224.0	213	131.657328
224.0	250.0	282.0	230	131.880280
282.0	315.0	355.0	198	134.362652
355.0	400.0	447.0	244	141.495634

4470.0	5000.0	5630.0	128	155.040723
5630.0	6300.0	7090.0	105	154.222211
7090.0	8000.0	8920.0	129	153.444054
8920.0	10000.0	11200.0	137	154.735595
11200.0	12500.0	14100.0	102	151.965704
14100.0	16000.0	17800.0	387	153.543531
17800.0	20000.0	22400.0	8	130.851242
22400.0	25000.0	28200.0	2	113.665973
28200.0	31500.0	35500.0	32	129.825000
35500.0	40000.0	44700.0	0	.000000

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EXECUTING PROG=NOISE
TAPIN= T     TAPOT= F
```
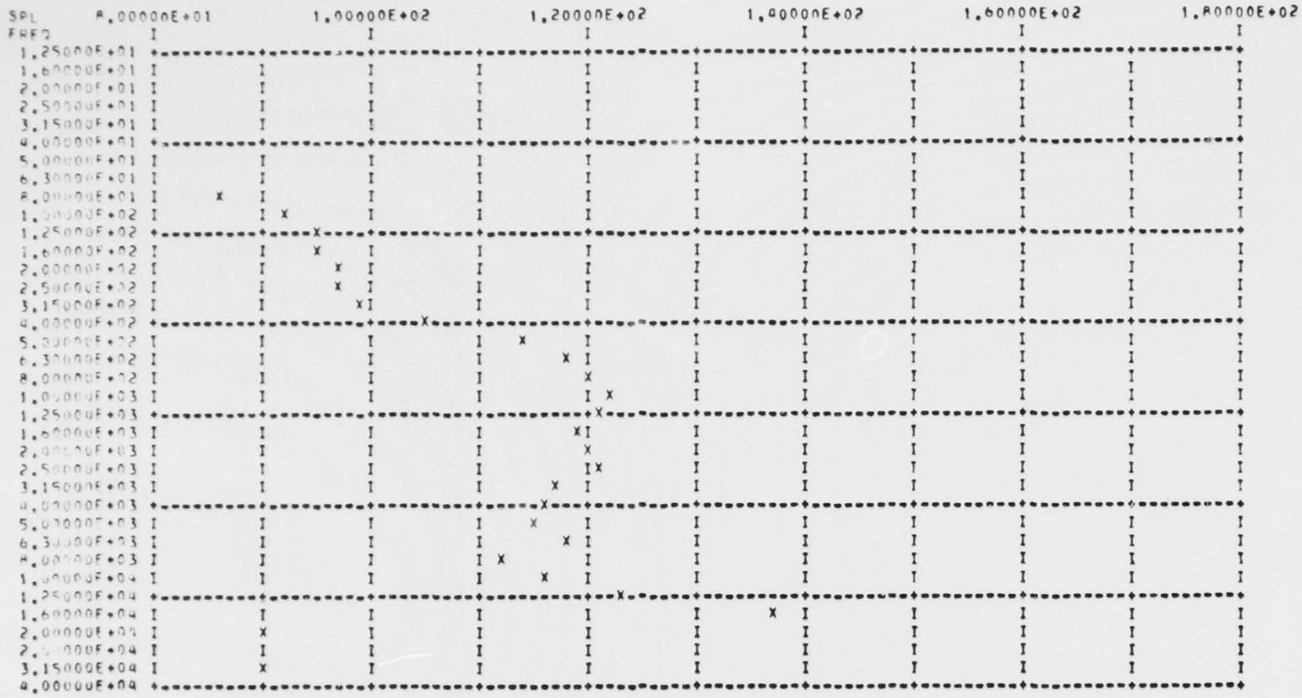

1/3 OCTAVE BAND ANALYSIS

X/D = 109.930 Y/D = 19.384 R/D = 111.626
SIDELINE DISTANCE= 6.95 ANGLE= 10.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	25.4131
22.4	25.0	28.2	1	32.1034
28.2	31.5	35.5	6	38.8825
35.5	40.0	44.7	6	42.6239
44.7	50.0	56.3	11	56.8428
56.3	63.0	70.9	18	68.3333
70.9	80.0	89.2	122	85.7403
89.2	100.0	112.0	153	92.4380
112.0	125.0	141.0	133	94.5554
141.0	160.0	178.0	214	95.3346
178.0	200.0	224.0	212	96.6929
224.0	250.0	282.0	229	97.3926
282.0	315.0	355.0	198	99.3452
355.0	400.0	447.0	243	104.5811
447.0	500.0	563.0	363	113.5737
563.0	630.0	709.0	231	118.0241
709.0	800.0	892.0	210	120.4689
892.0	1000.0	1120.0	186	121.5880
1120.0	1250.0	1410.0	109	121.2373
1410.0	1600.0	1780.0	140	119.4040
1780.0	2000.0	2240.0	122	120.0759
2240.0	2500.0	2820.0	124	120.8110
2820.0	3150.0	3550.0	151	116.7565
3550.0	4000.0	4470.0	130	116.0402
4470.0	5000.0	5630.0	104	115.1422
5630.0	6300.0	7090.0	120	117.6856
7090.0	8000.0	8920.0	94	111.7344
8920.0	10000.0	11200.0	119	115.5324
11200.0	12500.0	14100.0	100	123.1895
14100.0	16000.0	17800.0	305	136.9147
17800.0	20000.0	22400.0	3	90.2754
22400.0	25000.0	28200.0	0	.0000
28200.0	31500.0	35500.0	26	89.9945
35500.0	40000.0	44700.0	0	.0000

SPL VS. FREQ.


SPL
FREQ
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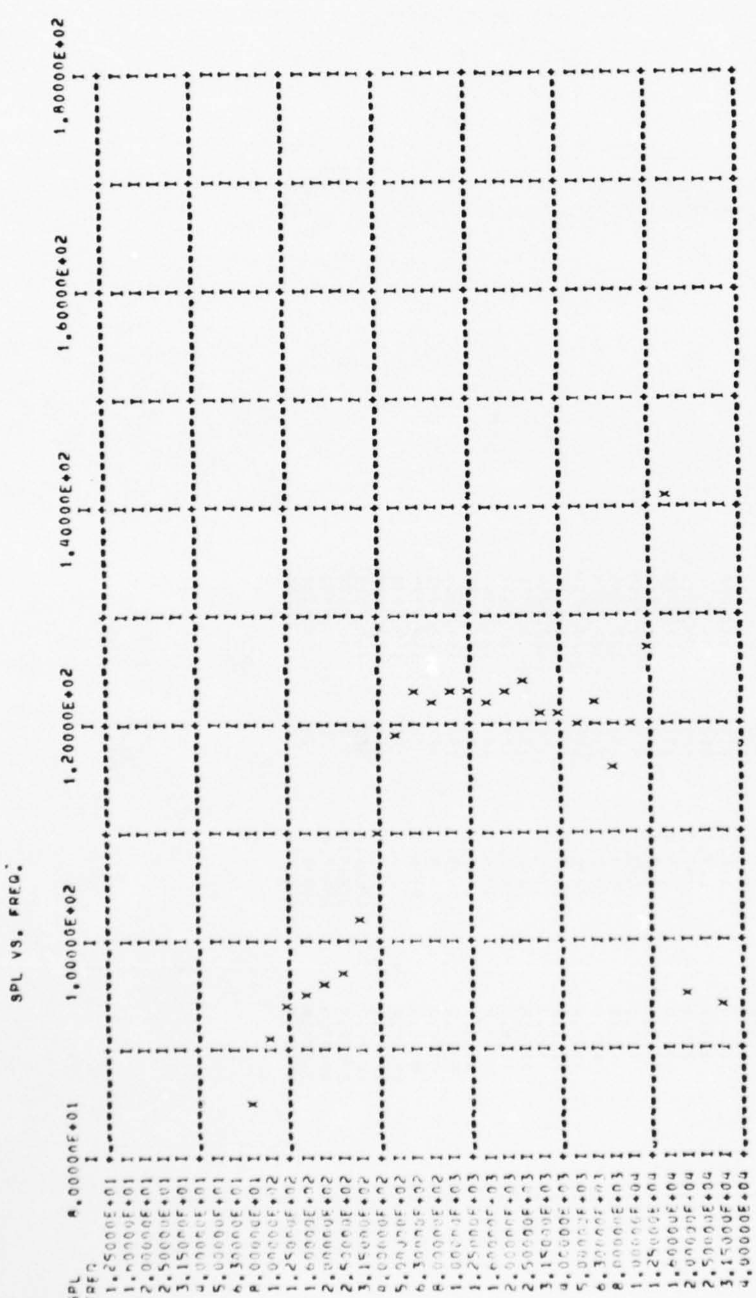
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = 104.894 Y/D = 38.178 R/D = 111.626
SIDELINE DISTANCE= 13.68 ANGLE= 20.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	24.7466
22.4	25.0	28.2	1	31.4652
28.2	31.5	35.5	6	38.2971
35.5	40.0	44.7	6	41.9771
44.7	50.0	56.3	11	56.1315
56.3	63.0	70.9	18	67.5532
70.9	80.0	89.2	122	84.7154
89.2	100.0	112.0	153	91.4515
112.0	125.0	141.0	133	93.6187
141.0	160.0	178.0	214	94.6022
178.0	200.0	224.0	212	96.2632
224.0	250.0	282.0	229	96.9215
282.0	315.0	355.0	198	101.5919
355.0	400.0	447.0	243	109.9775
447.0	500.0	563.0	363	119.0058
563.0	630.0	709.0	231	122.6985
709.0	800.0	892.0	210	122.3658
892.0	1000.0	1120.0	186	123.4771
1120.0	1250.0	1410.0	109	123.3216
1410.0	1600.0	1780.0	140	122.3058
1780.0	2000.0	2240.0	122	123.0201
2240.0	2500.0	2820.0	124	124.1807
2820.0	3150.0	3550.0	151	121.4340
3550.0	4000.0	4470.0	130	120.7390
4470.0	5000.0	5630.0	104	119.7056
5630.0	6300.0	7090.0	120	122.1401
7090.0	8000.0	8920.0	94	116.0785
8920.0	10000.0	11200.0	119	119.7930
11200.0	12500.0	14100.0	100	127.3272
14100.0	16000.0	17800.0	305	141.0513
17800.0	20000.0	22400.0	3	94.8679
22400.0	25000.0	28200.0	0	.0000
28200.0	31500.0	35500.0	26	94.1307
35500.0	40000.0	44700.0	0	.0000


SPL VS. FREQ.
SPL
FREQ
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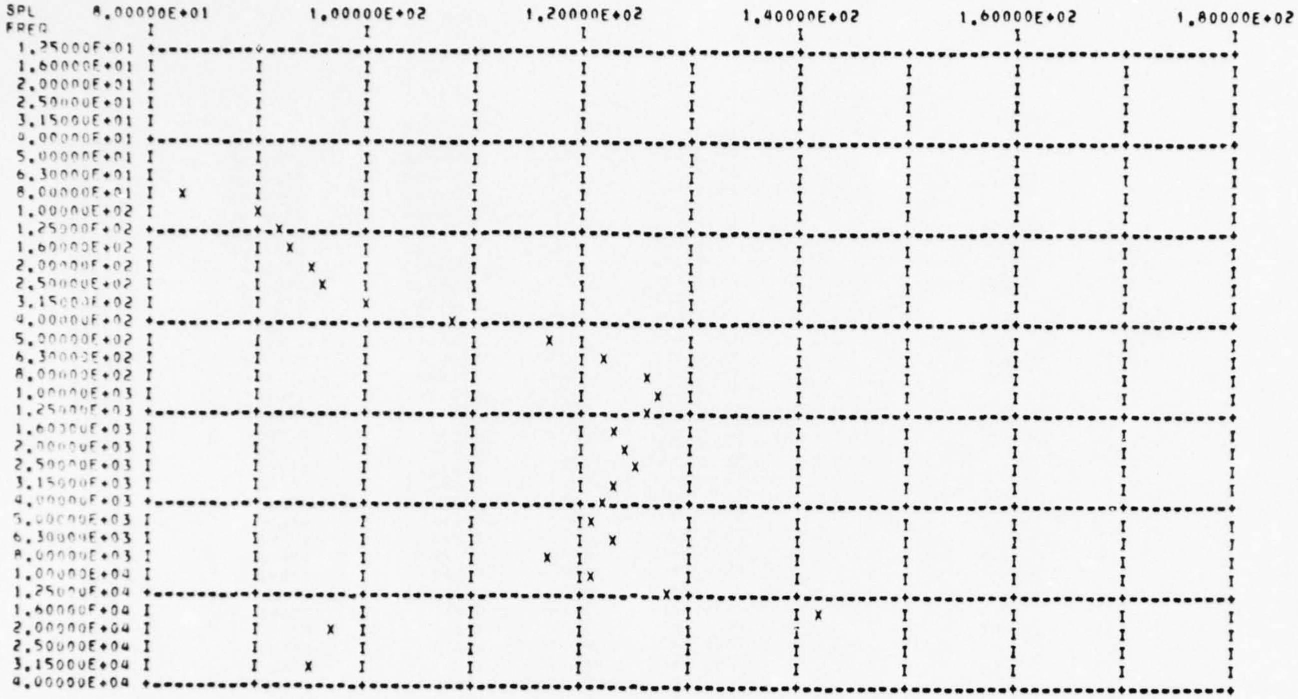
1.0000E+02
1.2000E+02
1.4000E+02
1.6000E+02
1.8000E+02

1/3 OCTAVE BAND ANALYSIS

X/D = 96.671 Y/D = 55,813 R/D = 111.626
SIDELINE DISTANCE= 20,00 ANGLE= 30,00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	,0000
14.1	16.0	17.8	3	,0000
17.8	20.0	22.4	7	23,5329
22.4	25.0	28.2	1	30,3091
28.2	31.5	35.5	6	37,2408
35.5	40.0	44.7	6	40,8296
44.7	50.0	56.3	11	54,8915
56.3	63.0	70.9	18	64,2271
70.9	80.0	89.2	122	83,0930
89.2	100.0	112.0	153	89,8827
112.0	125.0	141.0	133	92,1206
141.0	160.0	178.0	214	93,3954
178.0	200.0	224.0	212	95,4390
224.0	250.0	282.0	229	96,0404
282.0	315.0	355.0	198	100,1664
355.0	400.0	447.0	243	108,1503
447.0	500.0	563.0	363	116,8696
563.0	630.0	709.0	231	122,2035
709.0	800.0	892.0	210	125,9183
892.0	1000.0	1120.0	186	127,2141
1120.0	1250.0	1410.0	109	126,4057
1410.0	1600.0	1780.0	140	123,0296
1780.0	2000.0	2240.0	122	123,8732
2240.0	2500.0	2820.0	124	125,2499
2820.0	3150.0	3550.0	151	123,0891
3550.0	4000.0	4470.0	130	122,2914
4470.0	5000.0	5630.0	104	121,2606
5630.0	6300.0	7090.0	120	123,4292
7090.0	8000.0	8920.0	94	117,3297
8920.0	10000.0	11200.0	119	120,9224
11200.0	12500.0	14100.0	100	128,3115
14100.0	16000.0	17800.0	305	142,0222
17800.0	20000.0	22400.0	3	96,6162
22400.0	25000.0	28200.0	0	,0000
28200.0	31500.0	35500.0	26	95,2088
35500.0	40000.0	44700.0	0	,0000

SPL VS. FREQ.


SPL
FREQ
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1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
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1.00000E+04
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1.60000E+04
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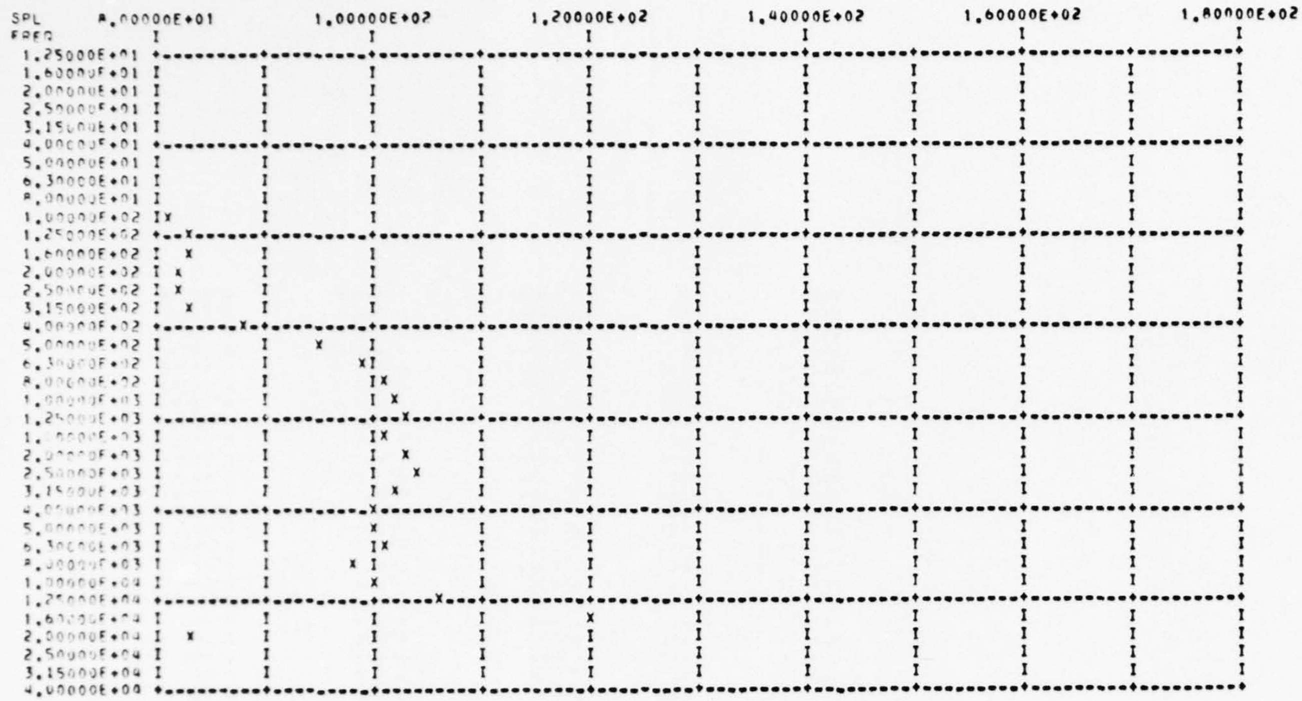
3.15000E+04
4.00000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = -96.680 Y/D = 55.818 R/D = 111.636
SIDELINE DISTANCE= 20.00 ANGLE= 150.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	19.2028
22.4	25.0	28.2	1	26.1171
28.2	31.5	35.5	6	33.3737
35.5	40.0	44.7	6	36.6196
44.7	50.0	56.3	11	49.9513
56.3	63.0	70.9	18	60.5118
70.9	80.0	89.2	122	74.9051
89.2	100.0	112.0	153	81.2333
112.0	125.0	141.0	133	83.1936
141.0	160.0	178.0	214	83.0261
178.0	200.0	224.0	212	82.4530
224.0	250.0	282.0	229	82.1997
282.0	315.0	355.0	198	83.2790
355.0	400.0	447.0	243	88.3607
447.0	500.0	563.0	363	95.0448
563.0	630.0	709.0	231	98.8320
709.0	800.0	892.0	210	101.3319
892.0	1000.0	1120.0	186	102.2410
1120.0	1250.0	1410.0	109	103.1743
1410.0	1600.0	1780.0	149	101.4692
1780.0	2000.0	2240.0	122	103.0262
2240.0	2500.0	2820.0	124	104.1767
2820.0	3150.0	3550.0	151	102.4954
3550.0	4000.0	4470.0	130	99.6525
4470.0	5000.0	5630.0	104	100.4645
5630.0	6300.0	7090.0	120	101.0466
7090.0	8000.0	8920.0	94	97.8172
8920.0	10000.0	11200.0	119	99.8560
11200.0	12500.0	14100.0	100	106.2298
14100.0	16000.0	17800.0	305	119.5739
17800.0	20000.0	22400.0	3	82.9115
22400.0	25000.0	28200.0	0	.0000
28200.0	31500.0	35500.0	26	74.7258
35500.0	40000.0	44700.0	0	.0000

SPL VS. FREQ.


SPL
FREQ
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1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
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3.15000E+01
4.00000E+01
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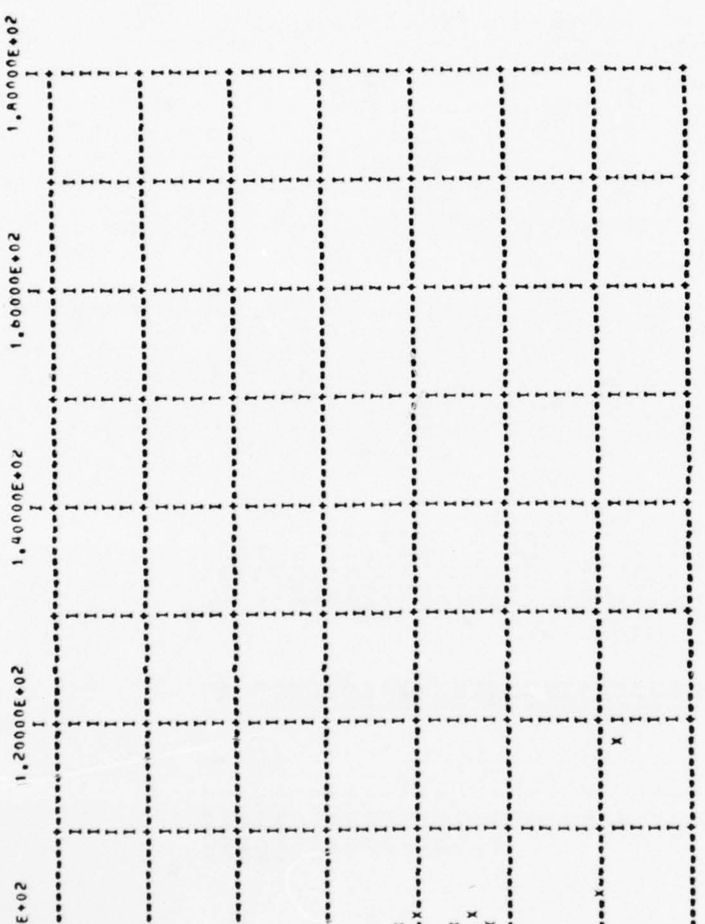
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = -104.909 Y/D = 38.184 R/D = 111.642
SIDELINE DISTANCE= 13.68 ANGLE= 160.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	.0000
14.1	16.0	17.8	3	.0000
17.8	20.0	22.4	7	19.2872
22.4	25.0	28.2	1	26.2144
28.2	31.5	35.5	6	33.4954
35.5	40.0	44.7	6	36.7346
44.7	50.0	56.3	11	50.0479
56.3	63.0	70.9	18	60.6008
70.9	80.0	89.2	122	74.9769
89.2	100.0	112.0	153	81.3118
112.0	125.0	141.0	133	83.2836
141.0	160.0	178.0	214	82.9328
178.0	200.0	224.0	212	81.6638
224.0	250.0	282.0	229	81.2641
282.0	315.0	355.0	198	82.0713
355.0	400.0	447.0	243	87.0624
447.0	500.0	563.0	363	93.6520
563.0	630.0	709.0	231	97.3674
709.0	800.0	892.0	210	99.8230
892.0	1000.0	1120.0	186	100.7034
1120.0	1250.0	1410.0	109	101.6109
1410.0	1600.0	1780.0	140	99.7184
1780.0	2000.0	2240.0	122	101.2912
2240.0	2500.0	2820.0	124	102.3911
2820.0	3150.0	3550.0	151	100.6320
3550.0	4000.0	4470.0	130	97.7190
4470.0	5000.0	5630.0	104	98.6041
5630.0	6300.0	7090.0	120	99.0869
7090.0	8000.0	8920.0	94	95.9608
8920.0	10000.0	11200.0	119	97.9198
11200.0	12500.0	14100.0	100	104.1999
14100.0	16000.0	17800.0	305	117.5209
17800.0	20000.0	22400.0	3	81.2483
22400.0	25000.0	28200.0	0	.0000
28200.0	31500.0	35500.0	26	72.7563
35500.0	40000.0	44700.0	0	.0000

SPL VS. FREQ.


SPL
FREQ
8.00000E+01
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

*   J E T   A N A L Y S I S   P R O G R A M   *

*   S U M M A R Y   A C O U S T I C   A N A L Y S I S   *

SELF + SHEAR NOISE FAR FIELD MODEL

```
                    *  AERODYNAMIC PARAMETERS  *

EXTERNAL CONDITIONS   JET DISCHARGE PARAMETERS     GAS PROPERTIES

TE =      518.700     DTAJ =      4.30000     GAM   =       1.40000
PE =   1.4696E+01     MJET =       1.5590     RG    =      53.34000
VE =         .000     TJET =      518.700     PR    =        .72000
ME =        .0000     PTJET=   5.8798E+01     PRT   =       1.00000
TIE=     .0           VJET =     1740.393     SC    =*00000000.000
                      TIJET=   1.0000E-01     TREF  =*00000000.000
                                              MUREF=    1.0000E+15
```

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                    *  FAR FIELD NOISE PARAMETERS  *

                 REFERENCE PRESSURE(PREFN)=          2.00000000E-04
                 AMBIENT SONIC VELOCITY(ASPEED)=            1116.35
                 SIDE-LINE DISTANCE (SLINE)=                13.6826

N  ANGLE,DEG.    SOUND PRES.     OASPL,DB      PNDB, DB                       OCTAVE CENTER FREQ(HZ)-SPLS
                                                           (63)     (125)    (250)    (500)    (1000)   (2000)   (4000)   (8000)
                                                         *******  *******  *******  *******  *******  *******  *******  *******
```

1	10.00000	2.456958E+06	137.8834	141.7150	85.824	99.043	102.731	119.498	125.894	124.906	120.801	120.388
2	20.00000	6.181102E+06	141.8901	145.1861	84.804	98.184	103.725	124.403	127.853	128.010	125.471	124.765
3	30.00000	7.950137E+06	142.9831	146.4068	83.188	96.802	102.530	123.449	131.317	128.941	127.049	125.999
4	150.00000	4.557342E+04	120.5665	125.1676	75.074	87.342	87.440	100.616	107.085	107.800	105.812	104.541
5	160.00000	2.879240E+04	118.5722	123.4614	75.146	87.362	86.450	99.181	105.545	106.040	103.933	102.611

** S U M M A R Y   A C O U S T I C   P O W E R   A N A L Y S I S **

TOTAL ACOUSTIC POWER OUTPUT OF JET= 173,396099 (PWL),DB

POWER OUTPUT PER JET RADIUS LENGTH

X	POWER	X	POWER	X	POWER	X	POWER
.00000	165,876510	.00010	171,275256	.00020	203,563694	.00030	200,670776
.00050	197,312114	.00080	194,235178	.00100	192,723433	.00200	188,018142
.00400	180,689392	.00600	175,877562	.00800	172,563868	.01000	169,932717
.01500	165,311882	.01700	163,981614	.02000	162,635426	.04000	159,906369
.06000	159,676846	.08000	159,589865	.10000	159,121895	.12000	158,964126
.20000	160,139082	.25000	158,578602	.30000	158,085369	.34000	157,647416
.40000	157,362273	.45000	157,408206	.50000	157,113875	.55000	156,735709
.60000	156,470304	.65000	157,496308	.70000	158,694761	.80000	158,559515
1.00000	154,816551	1.20000	153,755645	1.50000	152,102231	1.70000	152,051436
2.00000	155,800043	2.50000	155,669802	3.00000	154,225932	3.40000	153,213759
4.00000	153,169627	4.12865	153,032625	5.00000	153,397315	6.00000	153,383317
6.20000	152,764218	6.50000	152,262620	6.80000	152,286436	7.00000	151,241450
7.50000	151,081644	8.00000	150,319082	9.00000	148,795261	10.00000	146,574992
11.00000	143,958839	12.00000	141,469253	12.12730	141,404641	13.00000	137,492534
14.00000	135,223749	15.00000	131,684054	16.00000	129,520354	17.00000	125,634222
[illegible]	124,000986	19.00000	123,850576	20.00000	124,402685	21.00000	122,957598
22.00000	124,805451	23.00000	123,733985	24.00000	122,228115	25.00000	119,059755
[illegible]	118,200112	28.00000	117,585405	30.00000	117,737325	32.00000	115,384959
34.00000	113,565204	36.00000	111,814906				

AD-A038 614 GENERAL ELECTRIC CO CINCINNATI OHIO AIRCRAFT ENGINE GROUP F/G 20/1
SUPERSONIC JET EXHAUST NOISE INVESTIGATION. VOLUME III. COMPUTE--ETC(U)
JUL 76 D R FERGUSON, M A SMITH, P R KNOTT F33615-73-C-2031
UNCLASSIFIED R74AEG452-VOL-3 AFAPL-TR-76-68-VOL-3 NL

5 OF 8
AD
A038614

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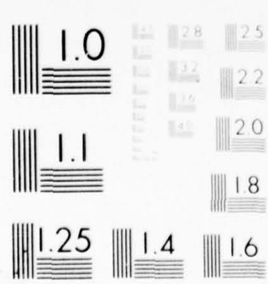


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS

1/3-OCTAVE BAND POWER SPECTRUM

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	POWER
11.2	12.5	14.1	1	.000000
14.1	16.0	17.8	3	.000000
17.8	20.0	22.4	7	59.016554
22.4	25.0	28.2	1	65.897768
28.2	31.5	35.5	6	73.012400
35.5	40.0	44.7	6	76.436737
44.7	50.0	56.3	11	90.204398
56.3	63.0	70.9	18	101.271071
70.9	80.0	89.2	122	117.492111
89.2	100.0	112.0	153	124.209279
112.0	125.0	141.0	133	126.818320
141.0	160.0	178.0	214	128.539481
178.0	200.0	224.0	212	131.657328
224.0	250.0	282.0	229	131.880280
282.0	315.0	355.0	198	134.362652
355.0	400.0	447.0	243	141.495634
447.0	500.0	563.0	363	150.126955
563.0	630.0	709.0	231	154.538576
709.0	800.0	892.0	210	156.916693
892.0	1000.0	1120.0	186	158.145086
1120.0	1250.0	1410.0	109	157.785999
1410.0	1600.0	1780.0	140	155.979998
1780.0	2000.0	2240.0	122	157.085416
2240.0	2500.0	2820.0	124	158.286527
2820.0	3150.0	3550.0	151	154.023532
3550.0	4000.0	4470.0	130	152.668413
4470.0	5000.0	5630.0	104	151.879929

5630.0	6300.0	7090.0	120	153.[illegible]75266
7090.0	8000.0	8920.0	94	148.[illegible]0315
8920.0	10000.0	11200.0	119	151.3[illegible]972
11200.0	12500.0	14100.0	100	158.51[illegible]97
14100.0	16000.0	17800.0	305	172.188[illegible]3
17800.0	20000.0	22400.0	3	129.532941
22400.0	25000.0	28200.0	0	.000000
28200.0	31500.0	35500.0	26	125.876510
35500.0	40000.0	44700.0	0	.000000

********* ENDJOB *********

** C A R D   I N P U T **

```
NAME=       DAVE FERGUSON
ADDRES=     EVENDALE (GE )
IDENT=      NEAR FIELD--LAT. QUAD.
JETMIX    F T
$A
DIAJ=4.55,MJET=1.3559,VJET=2781.,TIJET=.05,
PE=14.696,TE=518.7,ME=0.,TIF=0.,
CXTP=.04,
$
NOISE      T F
$A
QCONV=T,
NEARFD=2,JETTEM=1,BAND3=T,XCORE=4.36646,
ARC=F,SLINE=2.6,
NA=2,ANGJ(1)=90.,153.4,
$
```

EXECUTING PROGM=JETMIX
TAPIN= F   TAPOT= T

* FREE JET PROGRAM *

* AXISYMMETRIC * * N-ISOTHERMAL * * COMPRESSIBLE * JET

** SINGLE MIXING REGION **

NAME= DAVE FERGUSON
ADDRES= EVENDALE (GE)
IDENT= NEAR FIELD--LAT. QUAD.

* INPUT AND INITIAL CONDITIONS *

EXTERNAL CONDITIONS		JET DISCHARGE PARAMETERS		GAS PROPERTIES	
TE =	518.700	DIAJ =	4.55000	GAM =	1.40000
PE =	1.4696E+01	MJET =	1.3559	RG =	53.34000
VE =	0.000	TJET =	1858.833	PR =	.72000
ME =	0.0000	PTJET=	4.2540E+01	PRT =	1.00000
TIE=	0.	VJET =	2781.000	SC =	*00000000.000
		TIJET=	5.0000E-02	TREF =	*00000000.000
		FLOWJ=	5.4718E-01	MUREF=	1.0000E+15

* INITIAL PROFILES *

N	Y	PSI	U	THETA	TI
1	0.	0.	1.00000000	1.00000000	5.0000000E-02
2	3.4483E-02	6.3447E-06	1.00000000	1.00000000	5.0000000E-02
3	6.8966E-02	2.5379E-05	1.00000000	1.00000000	5.0000000E-02
4	1.0345E-01	5.7102E-05	1.00000000	1.00000000	5.0000000E-02
5	1.3793E-01	1.0152E-04	1.00000000	1.00000000	5.0000000E-02
6	1.7241E-01	1.5862E-04	1.00000000	1.00000000	5.0000000E-02
7	2.0690E-01	2.2841E-04	1.00000000	1.00000000	5.0000000E-02
8	2.4138E-01	3.1089E-04	1.00000000	1.00000000	5.0000000E-02
9	2.7586E-01	4.0606E-04	1.00000000	1.00000000	5.0000000E-02
10	3.1034E-01	5.1392E-04	1.00000000	1.00000000	5.0000000E-02
11	3.4483E-01	6.3447E-04	1.00000000	1.00000000	5.0000000E-02
12	3.7931E-01	7.6771E-04	1.00000000	1.00000000	5.0000000E-02
13	4.1379E-01	9.1364E-04	1.00000000	1.00000000	5.0000000E-02
14	4.4828E-01	1.0723E-03	1.00000000	1.00000000	5.0000000E-02
15	4.8276E-01	1.2436E-03	1.00000000	1.00000000	5.0000000E-02
16	5.1724E-01	1.4276E-03	1.00000000	1.00000000	5.0000000E-02
17	5.5172E-01	1.6242E-03	1.00000000	1.00000000	5.0000000E-02
18	5.8621E-01	1.8336E-03	1.00000000	1.00000000	5.0000000E-02
19	6.2069E-01	2.0557E-03	1.00000000	1.00000000	5.0000000E-02
20	6.5517E-01	2.2904E-03	1.00000000	1.00000000	5.0000000E-02
21	6.8966E-01	2.5379E-03	1.00000000	1.00000000	5.0000000E-02
22	7.2414E-01	2.7980E-03	1.00000000	1.00000000	5.0000000E-02
23	7.5862E-01	3.0708E-03	1.00000000	1.00000000	5.0000000E-02
24	7.9310E-01	3.3564E-03	1.00000000	1.00000000	5.0000000E-02
25	8.2759E-01	3.6546E-03	1.00000000	1.00000000	5.0000000E-02
26	8.6207E-01	3.9654E-03	1.00000000	1.00000000	5.0000000E-02
27	8.9655E-01	4.2890E-03	1.00000000	1.00000000	5.0000000E-02
28	9.3103E-01	4.6253E-03	1.00000000	1.00000000	5.0000000E-02
29	9.6552E-01	4.9743E-03	1.00000000	1.00000000	5.0000000E-02
30	9.8276E-01	5.1458E-03	.75000000	.81976150	4.3301270E-02
31	1.0000E+00	5.3004E-03	.50000000	.63952300	3.5355339E-02
32	1.0172E+00	5.4233E-03	.25000000	.45928450	2.5000000E-02
33	1.0345E+00	5.4743E-03	0.00000000	.27904600	0.

* JET ANALYSIS PROGRAM *

PROFILES-- STA (12) X= .01000 PRESSURE= 14.6960

				** DIMENSIONLESS	**			**	** DIMENSIONAL	**	
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
24	.79310	3.3564E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
25	.82759	3.6546E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
26	.86207	3.9654E-03	1.000000	1.000000	4.95040E-02	.9998986	1.0006580	1.35621	2781.0000	1858.8333	2406.5092	42.5588
27	.89655	4.2890E-03	1.000000	1.000000	4.95040E-02	.9998987	1.0006578	1.35621	2781.0000	1858.8334	2406.5093	42.5588
28	.93103	4.6253E-03	.999997	1.000003	4.95080E-02	.9998999	1.0006469	1.35621	2780.9929	1858.8382	2406.5116	42.5584
29	.96553	4.9743E-03	.996990	.997937	5.25663E-02	.9965377	.9949082	1.35343	2772.6284	1854.9979	2400.1639	42.3987
30	.98281	5.1458E-03	.749286	.819488	5.16658E-02	.7032319	.5941310	1.11472	2083.7631	1523.2914	1846.4023	31.2392
31	1.00018	5.3004E-03	.497241	.637777	4.93393E-02	.4336603	.2940961	.83118	1382.8277	1185.5211	1337.4510	22.8849
32	1.01767	5.4233E-03	.263812	.470302	8.81363E-02	.2193955	.1009492	.50807	733.6623	874.2127	932.9189	17.5069
33	1.05799	5.4743E-03	.018601	.292996	1.53212E-02	.0140922	.0007559	.04522	51.7294	544.6302	545.3061	14.7170
34	10.60351	5.5252E-03	.000012	.279061	3.09085E-04	.0000150	.0000000	.00003	.0333	518.7281	518.7283	14.6960
35	8579.92511	5.5761E-03	.000000	.279046	4.85329E-07	.0000000	0.0000000	.00000	.0000	518.7000	518.7000	14.6960
36	*5474.26122	5.6271E-03	.000000	.279046	7.19314E-10	.0000000	0.0000000	.00000	.0000	518.7000	518.7000	14.6960
37	*1396.77740	5.6780E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (15) X= .02000 PRESSURE= 14.6960

N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
		*		** DIMENSIONLESS		**		**		** DIMENSIONAL	**	*
1	0.00000	0.	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2761.0000	1858.8333	2406.4440	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
24	.79310	3.3564E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
25	.82759	3.6546E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
26	.86207	3.9654E-03	1.000000	1.000000	4.90984E-02	.9998641	1.0006580	1.35621	2781.0000	1858.8333	2406.4440	42.5588
27	.89655	4.2890E-03	1.000000	1.000000	4.90985E-02	.9998645	1.0006573	1.35621	2781.0000	1858.8341	2406.4448	42.5587
28	.93104	4.6253E-03	.999972	1.000019	4.91181E-02	.9998671	1.0005497	1.35616	2780.9210	1858.8691	2406.4497	42.5557
29	.96556	4.9743E-03	.992937	.995149	5.57504E-02	.9919452	.9872128	1.34968	2761.3582	1849.8165	2391.4932	42.1844
30	.98286	5.1458E-03	.747165	.818364	6.16455E-02	.7022402	.5908109	1.11227	2077.8666	1521.2019	1844.5300	31.1468
31	1.00030	5.3004E-03	.489339	.631789	6.68287E-02	.4273740	.2864089	.82157	1360.8514	1174.3904	1325.5825	22.6709
32	1.01754	5.4233E-03	.281892	.487740	1.37098E-01	.2506411	.1118775	.53378	783.9430	906.6276	991.9106	17.8112
33	1.03193	5.4743E-03	.075867	.337637	5.58611E-02	.0628394	.0109872	.17182	210.9850	627.6106	637.3409	15.0019
34	1.52766	5.5252E-03	.001072	.280247	5.19550E-03	.0012106	.0000026	.00267	2.9819	520.9327	520.9856	14.6961
35	204.81956	5.5761E-03	.000000	.279046	2.95113E-05	.0000002	0.0000000	.00000	.0001	518.7003	518.7003	14.6960
36	*9414.67489	5.6271E-03	.000000	.279046	7.50290E-08	.0000000	0.0000000	.00000	.0000	518.7000	518.7000	14.6960
37	*9588.44334	5.6780E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (16) X= .04000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS TI	TTD **	PTD	MACH **	U	** DIMENSIONAL T	TOT **	PTOT *
1	0.00000	0.	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
24	.79310	3.3564E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
25	.82759	3.6546E-03	1.000000	1.000000	4.83296E-02	.9997993	1.0006580	1.35621	2781.0000	1858.8333	2406.3218	42.5588
26	.86207	3.9654E-03	1.000000	1.000000	4.83296E-02	.9997994	1.0006579	1.35621	2781.0000	1858.8333	2406.3218	42.5588
27	.89655	4.2890E-03	1.000000	1.000002	4.83299E-02	.9998012	1.0006552	1.35621	2781.0000	1858.8370	2406.3253	42.5587
28	.93104	4.6253E-03	.999845	.999999	4.84224E-02	.9997170	1.0002134	1.35600	2780.5678	1858.8321	2406.1663	42.5464
29	.96562	4.9743E-03	.982849	.988251	6.24992E-02	.9805300	.9681572	1.34029	2733.3018	1836.9941	2369.9413	41.6538
30	.98300	5.1458E-03	.738157	.813044	8.22636E-02	.6958872	.5773148	1.10220	2052.8139	1511.3133	1832.5355	30.7710
31	1.00062	5.3004E-03	.474200	.621800	9.87730E-02	.4181952	.2711790	.80207	1318.7507	1155.8226	1308.2527	22.2468
32	1.01794	5.4233E-03	.288286	.497228	1.46392E-01	.2636508	.1149982	.54102	801.7225	924.2637	1016.4729	17.8981
33	1.02728	5.4743E-03	.185198	.422139	1.24127E-01	.1683340	.0558360	.37510	515.0355	784.6668	836.5147	16.1950
34	1.04973	5.5252E-03	.042406	.317589	4.58569E-02	.0407113	.0036315	.09902	117.9311	590.3448	595.5629	14.7971
35	2.18052	5.5761E-03	.000369	.279640	3.94350E-03	.0006496	.0000003	.00092	1.0265	519.8962	519.9264	14.6960
36	374.56070	5.6271E-03	.000000	.279046	2.99820E-05	.0000002	0.0000000	.00000	.0000	518.7003	518.7003	14.6960
37	529.70434	5.6780E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (17) X= .06000 PRESSURE= 14.6960

	*		** DIMENSIONLESS		**			**		** DIMENSIONAL	**	*
N	Y	PSI	UD	THD	TT	TTD	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
24	.79310	3.3564E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
25	.82759	3.6546E-03	1.000000	1.000000	4.76317E-02	.9997415	1.0006580	1.35621	2781.0000	1858.8333	2406.2126	42.5588
26	.86207	3.9654E-03	1.000000	1.000000	4.76317E-02	.9997416	1.0006579	1.35621	2781.0000	1858.8334	2406.2127	42.5588
27	.89655	4.2890E-03	1.000000	1.000004	4.76330E-02	.9997453	1.0006523	1.35621	2781.0000	1858.8409	2406.2198	42.5586
28	.93104	4.6253E-03	.999576	.999885	4.78766E-02	.9994116	.9996043	1.35571	2779.8219	1858.6189	2405.5897	42.5294
29	.96570	4.9743E-03	.969405	.979114	7.03836E-02	.9654277	.9430394	1.32768	2695.9149	1820.0102	2341.4281	40.9544
30	.98319	5.1458E-03	.724303	.804715	1.03050E-01	.6854259	.5570298	1.08670	2014.2859	1495.8318	1812.7845	30.2062
31	1.00100	5.3004E-03	.467993	.621224	1.21636E-01	.4205882	.2633309	.79192	1301.4897	1154.7523	1312.7708	22.0283
32	1.01841	5.4233E-03	.291441	.502849	1.39945E-01	.2678586	.1163111	.54409	810.4964	934.7130	1024.4172	17.9346
33	1.02732	5.4743E-03	.213483	.447090	1.27464E-01	.1973033	.0681585	.42093	593.6963	831.0654	891.2087	16.5938
34	1.03928	5.5252E-03	.123100	.379582	9.24637E-02	.1128936	.0259859	.26293	342.3414	705.5803	731.8431	15.4196
35	1.09112	5.5761E-03	.014682	.294436	2.28911E-02	.0157618	.0004686	.03561	40.8316	547.3077	548.4583	14.7090
36	6.87665	5.6271E-03	.000029	.279110	9.50483E-04	.0000642	.0000000	.00007	.0805	518.8194	518.8211	14.6960
37	9.66365	5.6780E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (19)   X=   .10000   PRESSURE=   14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT*
1	0.00000	0.	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
24	.79310	3.3564E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006580	1.35621	2781.0000	1858.8333	2406.0532	42.5588
25	.82759	3.6546E-03	1.000000	1.000000	4.65950E-02	.9996571	1.0006579	1.35621	2781.0000	1858.8333	2406.0533	42.5588
26	.86207	3.9654E-03	1.000000	1.000002	4.65950E-02	.9996586	1.0006557	1.35621	2781.0000	1858.8363	2406.0560	42.5587
27	.89655	4.2890E-03	.999970	1.000086	4.66068E-02	.9997196	1.0004533	1.35612	2780.9169	1858.9924	2406.1713	42.5531
28	.93106	4.6253E-03	.997949	.998954	4.78409E-02	.9976153	.9962408	1.35409	2775.2967	1856.8881	2402.1984	42.4358
29	.96600	4.9743E-03	.924315	.948635	9.49540E-02	.9160105	.8614624	1.28467	2570.5194	1763.3545	2248.1284	38.6829
30	.98385	5.1458E-03	.689642	.785505	1.44929E-01	.6619411	.5067272	1.04639	1917.8947	1460.1228	1768.4452	28.8055
31	1.00195	5.3004E-03	.472913	.634456	1.54993E-01	.4434992	.2633500	.79244	1315.1717	1179.3486	1356.0267	22.0288
32	1.01904	5.4233E-03	.317849	.526692	1.45506E-01	.2977656	.1334335	.58075	883.9383	979.0331	1080.8816	18.4114
33	1.02729	5.4743E-03	.255817	.481874	1.35097E-01	.2397480	.0921680	.48713	711.4259	895.7233	971.3444	17.2624
34	1.03685	5.5252E-03	.193706	.435713	1.19836E-01	.1815958	.0571847	.38654	538.6951	809.9183	861.5530	16.2883
35	1.04893	5.5761E-03	.127185	.385173	9.66965E-02	.1195649	.0273608	.26968	353.7004	715.9716	744.4386	15.4578
36	1.07577	5.6271E-03	.035242	.314295	3.96610E-02	.0367367	.0025325	.08272	98.0069	584.2219	588.0589	14.7665
37	2.03518	5.6780E-03	.000454	.279828	4.07836E-03	.0007869	.0000005	.00113	1.2626	520.1534	520.1857	14.6960
38	2.66957	5.7290E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (21) X= .20000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
1	0.00000	0.	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006580	1.35621	2781.0000	1858.8333	2405.7454	42.5588
24	.79310	3.3564E-03	1.000000	1.000000	4.45240E-02	.9994941	1.0006579	1.35621	2781.0000	1858.8333	2405.7455	42.5588
25	.82759	3.6546E-03	1.000000	1.000001	4.45241E-02	.9994953	1.0006561	1.35621	2781.0000	1858.8358	2405.7478	42.5587
26	.86207	3.9654E-03	.999987	1.000057	4.45287E-02	.9995400	1.0005415	1.35616	2780.9645	1858.9401	2405.8321	42.5555
27	.89656	4.2890E-03	.999339	.999964	4.48168E-02	.9991024	.9988138	1.35534	2779.1607	1858.7658	2405.0060	42.5074
28	.93118	4.6253E-03	.982269	.989174	5.67043E-02	.9804537	.9652874	1.33892	2731.6894	1838.7099	2369.7973	41.5739
29	.96726	4.9743E-03	.799484	.869714	1.46654E-01	.7904018	.6523479	1.15696	2223.3644	1616.6541	2010.9790	32.8603
30	.98608	5.1458E-03	.639537	.766583	1.76306E-01	.6330523	.4325500	.98143	1778.5520	1424.9496	1713.9031	26.7401
31	1.00465	5.3004E-03	.492479	.666365	1.74862E-01	.4861019	.2734436	.80661	1369.5848	1238.6613	1436.4607	22.3099
32	1.02114	5.4233E-03	.377484	.584482	1.60491E-01	.3713701	.1735907	.65712	1049.7833	1086.4544	1219.8471	19.5295
33	1.02862	5.4743E-03	.330624	.549970	1.51805E-01	.3247708	.1387197	.59206	919.4653	1022.3016	1131.8675	18.5586
34	1.03665	5.5252E-03	.284220	.515050	1.41483E-01	.2787210	.1074493	.52473	790.4150	957.3923	1044.9254	17.6879
35	1.04542	5.5761E-03	.238108	.479541	1.29488E-01	.2330847	.0796289	.45444	662.1789	891.3873	958.7640	16.9132
36	1.05525	5.6271E-03	.191918	.443099	1.15595E-01	.1875391	.0551296	.37999	533.7228	823.6464	872.7740	16.2311
37	1.06674	5.6780E-03	.144684	.405090	9.90503E-02	.1412676	.0338078	.29915	402.3655	752.9944	785.4133	15.6374
38	1.08168	5.7290E-03	.092429	.362635	7.62120E-02	.0911509	.0152268	.20198	257.0457	674.0783	690.7929	15.1200
39	1.12306	5.7799E-03	.019880	.301992	2.73310E-02	.0234899	.0008377	.04760	55.2852	561.3522	563.0490	14.7193
40	3.34945	5.8308E-03	.000135	.279341	2.17667E-03	.0002957	.0000000	.00034	.3751	519.2491	519.2583	14.6960
41	4.60178	5.8818E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (23) X= .30000 PRESSURE= 14.6960

		*			** DIMENSIONLESS	**			**		** DIMENSIONAL	**	*
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
15	.99278	1.8238E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
18	.58824	1.8336E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006580	1.35621	2781.0000	1858.8333	2405.5248	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.29783E-02	.9993772	1.0006579	1.35621	2781.0000	1858.8333	2405.5249	42.5589
24	.79310	3.3564E-03	1.000000	1.000000	4.29783E-02	.9993777	1.0006573	1.35621	2781.0000	1858.8342	2405.5257	42.5587
25	.82759	3.6546E-03	1.000000	1.000010	4.29795E-02	.9993868	1.0006436	1.35620	2781.0000	1858.8524	2405.5429	42.5584
26	.86207	3.9654E-03	.999821	1.000119	4.30337E-02	.9993879	.9999808	1.35589	2780.5032	1859.0542	2405.5449	42.5399
27	.89660	4.2890E-03	.996092	.998245	4.50689E-02	.9956732	.9919215	1.35201	2770.1310	1855.5706	2398.5316	42.3155
28	.93149	4.6253E-03	.945516	.966249	7.77259E-02	.9412368	.8951083	1.30295	2629.4794	1796.0966	2295.7557	39.6198
29	.96872	4.9743E-03	.724572	.833042	1.63217E-01	.7287967	.5433416	1.07715	2028.9394	1548.4860	1894.6686	29.8250
30	.98830	5.1458E-03	.608877	.755754	1.75251E-01	.6107994	.3901979	.94058	1693.2878	1404.8212	1671.8896	25.5608
31	1.00725	5.3004E-03	.496488	.679897	1.72399E-01	.4994457	.2722636	.80561	1380.7325	1263.8156	1461.6538	22.2776
32	1.02360	5.4233E-03	.406815	.616173	1.62075E-01	.4096691	.1934092	.69101	1131.3528	1145.3638	1292.1556	20.0814
33	1.03082	5.4743E-03	.369842	.588975	1.56015E-01	.3724927	.1645426	.64153	1028.5302	1094.8060	1221.9665	19.2776
34	1.03838	5.5252E-03	.333031	.561328	1.48912E-01	.3354030	.1378465	.59073	926.1582	1043.4149	1151.9410	18.5343
35	1.04636	5.5761E-03	.296385	.533214	1.40794E-01	.2984268	.1132726	.53844	824.2474	991.1552	1082.1299	17.8500
36	1.05486	5.6271E-03	.259870	.504583	1.31664E-01	.2615537	.0907725	.48437	722.6997	937.9348	1012.5136	17.2235
37	1.06403	5.6780E-03	.223389	.475333	1.21475E-01	.2247139	.0703024	.42810	621.2437	883.5654	942.9599	16.6535
38	1.07410	5.7290E-03	.186733	.445273	1.10098E-01	.1877364	.0518291	.36888	519.3041	827.6891	873.1464	16.1392
39	1.08550	5.7799E-03	.149464	.414106	9.72035E-02	.1502531	.0353278	.30565	415.6600	769.7538	802.3779	15.6797
40	1.09909	5.8308E-03	.110489	.381217	8.17853E-02	.1115961	.0207737	.23549	307.2707	708.6197	729.3935	15.2744
41	1.11796	5.8818E-03	.064430	.342323	5.73563E-02	.0670789	.0077993	.14491	179.1804	636.3205	645.3449	14.9132
42	1.20625	5.9327E-03	.007683	.289464	1.58928E-02	.0105357	.0001305	.01879	21.3651	538.0657	538.5914	14.6996
43	1.28851	5.9837E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

• JET ANALYSIS PROGRAM •

PROFILES-- STA (25) X= .40000 PRESSURE= 14.6960

N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
			** DIMENSIONLESS **						** DIMENSIONAL **			
1	0.00000	0.	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006580	1.35621	2781.0000	1858.8333	2405.3575	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.17677E-02	.9992886	1.0006579	1.35621	2781.0000	1858.8333	2405.3575	42.5588
23	.75862	3.0708E-03	1.000000	1.000000	4.17677E-02	.9992889	1.0006576	1.35621	2781.0000	1858.8338	2405.3580	42.5587
24	.79310	3.3564E-03	1.000000	1.000006	4.17680E-02	.9992939	1.0006500	1.35621	2781.0000	1858.8440	2405.3675	42.5585
25	.82759	3.6546E-03	.999953	1.000090	4.17787E-02	.9993448	1.0003994	1.35609	2780.8699	1858.9997	2405.4637	42.5516
26	.86209	3.9654E-03	.999056	.999830	4.21191E-02	.9986137	.9981894	1.35504	2778.3734	1858.5170	2404.0833	42.4900
27	.89669	4.2890E-03	.986577	.992680	4.98167E-02	.9854977	.9726191	1.34258	2743.6696	1845.2265	2379.3202	41.7780
28	.93204	4.6253E-03	.895456	.936531	1.01718E-01	.8906346	.8029617	1.25202	2490.2636	1740.8546	2200.2187	37.0540
29	.97026	4.9743E-03	.693251	.816195	1.66602E-01	.6984581	.4896545	1.03329	1927.9299	1517.1710	1837.3894	28.3302
30	.99032	5.1458E-03	.590840	.750333	1.72795E-01	.5982619	.3659665	.91577	1643.1274	1394.7434	1648.2188	24.8861
31	1.00954	5.3004E-03	.497164	.686982	1.69329E-01	.5054349	.2699201	.80283	1382.6133	1276.9857	1472.9615	22.2118
32	1.02584	5.4233E-03	.422663	.634084	1.61301E-01	.4307952	.2040959	.70843	1175.4266	1178.6573	1332.0415	20.3789
33	1.03294	5.4743E-03	.391922	.611539	1.56765E-01	.3998097	.1794877	.66805	1089.9358	1136.7495	1273.5410	19.6937
34	1.04028	5.5252E-03	.361298	.588643	1.51525E-01	.3688377	.1563998	.62687	1004.7686	1094.1890	1215.0657	19.0509
35	1.04791	5.5761E-03	.330806	.565396	1.45600E-01	.3379057	.1348022	.58482	919.9726	1050.9768	1156.6662	18.4495
36	1.05588	5.6271E-03	.300455	.541792	1.39004E-01	.3070315	.1146648	.54180	835.5652	1007.1012	1098.3757	17.8888
37	1.06426	5.6780E-03	.270234	.517814	1.31737E-01	.2762187	.0959585	.49767	751.5208	962.5298	1040.2010	17.3679
38	1.07312	5.7290E-03	.240111	.493426	1.23784E-01	.2454498	.0786571	.45222	667.7500	917.1964	982.1094	16.8862
39	1.08262	5.7799E-03	.210019	.468562	1.15106E-01	.2146735	.0627389	.40517	584.0616	870.9779	924.0037	16.4429
40	1.09292	5.8308E-03	.179823	.443101	1.05614E-01	.1837795	.0481884	.35604	500.0876	823.6503	865.6758	16.0378
41	1.10434	5.8818E-03	.149262	.416867	9.51286E-02	.1525430	.0349911	.30422	415.0963	774.8868	806.7013	15.6703
42	1.11744	5.9327E-03	.117753	.389528	8.32390E-02	.1205885	.0231270	.24828	327.4702	724.0671	746.3712	15.3400
43	1.13359	5.9837E-03	.083654	.360023	6.86829E-02	.0869366	.0125409	.18347	232.6417	669.2229	682.8364	15.0452
44	1.16027	6.0346E-03	.037710	.321230	4.00359E-02	.0436561	.0028377	.08756	104.8721	597.1123	601.1228	14.7750
45	1.48568	6.0855E-03	.001642	.282122	7.84019E-03	.0030918	.0000061	.00407	4.5652	524.4169	524.5373	14.6962
46	1.75164	6.1365E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (27) X= .50000 PRESSURE= 14.6960

N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
	*		** DIMENSIONLESS				**		** DIMENSIONAL		**	*
1	0.00000	0.	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	4.07477E-02	.9992159	1.0006580	1.35621	2781.0000	1858.8333	2405.2202	42.5588
22	.72414	2.7980E-03	1.000000	1.000000	4.07477E-02	.9992160	1.0006578	1.35621	2781.0000	1858.8335	2405.2204	42.5588
23	.75862	3.0708E-03	1.000000	1.000002	4.07477E-02	.9992180	1.0006548	1.35621	2781.0000	1858.8375	2405.2242	42.5587
24	.79310	3.3564E-03	.999991	1.000045	4.07499E-02	.9992520	1.0005688	1.35617	2780.9741	1858.9168	2405.2885	42.5563
25	.82759	3.6546E-03	.999760	1.000082	4.08091E-02	.9991570	.9998553	1.35583	2780.3313	1858.9852	2405.1090	42.5364
26	.86211	3.9654E-03	.996740	.998645	4.22033E-02	.9961974	.9932157	1.35264	2771.9330	1856.3142	2399.5213	42.3515
27	.89687	4.2890E-03	.967788	.981611	6.06105E-02	.9657159	.9353181	1.32390	2691.4192	1824.6521	2341.9721	40.7594
28	.93282	4.6255E-03	.847614	.909991	1.21207E-01	.8453378	.7186140	1.20107	2357.2156	1691.5209	2114.6984	34.7054
29	.97191	4.9743E-03	.669169	.804951	1.65588E-01	.6776759	.4559380	1.00385	1860.9588	1496.2706	1798.1525	27.3913
30	.99231	5.1458E-03	.579399	.747341	1.69351E-01	.5902420	.3508448	.89971	1611.3087	1389.1833	1633.0773	24.4651
31	1.01169	5.3004E-03	.497834	.692215	1.65845E-01	.5095470	.2684211	.80108	1384.4750	1286.7116	1480.7250	22.1700
32	1.02796	5.4233E-03	.433149	.646393	1.59135E-01	.4447820	.2110698	.71955	1204.5870	1201.5362	1358.4467	20.5737
33	1.03498	5.4743E-03	.406475	.626913	1.55460E-01	.4178968	.1693910	.68491	1130.4080	1165.3273	1307.6895	19.9695
34	1.04220	5.5252E-03	.379909	.607161	1.51268E-01	.3910186	.1688649	.64974	1056.5275	1128.6105	1256.9434	19.3479
35	1.04964	5.5761E-03	.353466	.587140	1.46576E-01	.3641698	.1494883	.61402	982.9400	1091.3456	1206.2529	18.8584
36	1.05732	5.6271E-03	.327158	.566854	1.41399E-01	.3373686	.1312375	.57768	909.8268	1053.6878	1155.6521	18.3502
37	1.06530	5.6780E-03	.300990	.546302	1.35746E-01	.3106271	.1140894	.54068	837.0522	1015.4843	1105.1642	17.8728
38	1.07362	5.7290E-03	.274958	.525475	1.29619E-01	.2839499	.0980218	.50292	764.6574	976.7704	1054.7976	17.4254
39	1.08235	5.7799E-03	.249048	.504356	1.23014E-01	.2573299	.0830146	.46430	692.6023	937.5138	1004.5390	17.0675
40	1.09153	5.8308E-03	.223230	.482913	1.15914E-01	.2307436	.0690504	.42466	620.8015	897.6550	954.3441	16.6187
41	1.10132	5.8818E-03	.197448	.461091	1.08281E-01	.2041431	.0561159	.38377	549.1019	857.0919	904.1223	16.2565
42	1.11187	5.9327E-03	.171608	.438800	1.00050E-01	.1774422	.0442032	.34132	477.2412	815.6562	853.7110	15.9268
43	1.12344	5.9837E-03	.145541	.415933	9.10924E-02	.1504808	.0333070	.29697	404.7497	773.1507	802.8079	15.6234
44	1.13644	6.0346E-03	.118914	.392319	8.11482E-02	.1230793	.0234221	.24983	330.6998	729.2564	751.0737	15.3482
45	1.15175	6.0855E-03	.090964	.367407	6.95816E-02	.0947691	.0145498	.19748	252.9710	682.9491	697.6242	15.1011
46	1.17187	6.1365E-03	.058857	.338852	5.37452E-02	.0630172	.0065697	.13306	163.6820	629.8691	637.6765	14.8789
47	1.22956	6.1874E-03	.012749	.296608	2.06083E-02	.0177804	.0003507	.03080	35.4545	551.3447	552.2694	14.7059
48	5.02037	6.2364E-03	.000057	.279164	1.24340E-03	.0001181	.0000000	.00014	.1572	518.9200	518.9230	14.6960
49	6.99260	6.2893E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (31) X= .70000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS **					**	** DIMENSIONAL **			
1	0.00000	0.	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	3.91285E-02	.9991042	1.0006580	1.35621	2781.0000	1858.8333	2405.0093	42.5588
20	.65517	2.2904E-03	1.000000	1.000000	3.91285E-02	.9991042	1.0006579	1.35621	2781.0000	1858.8333	2405.0093	42.5588
21	.68966	2.5379E-03	1.000000	1.000000	3.91285E-02	.9991044	1.0006575	1.35621	2781.0000	1858.8339	2405.0098	42.5587
22	.72414	2.7980E-03	1.000000	1.000004	3.91286E-02	.9991081	1.0006519	1.35621	2781.0000	1858.8413	2405.0168	42.5586
23	.75862	3.0708E-03	.999985	1.000053	3.91309E-02	.9991448	1.0005403	1.35616	2780.9579	1858.9326	2405.0860	42.5555
24	.79311	3.3564E-03	.999763	1.000066	3.91790E-02	.9990320	.9998875	1.35585	2780.3414	1858.9560	2404.8730	42.5373
25	.82762	3.6546E-03	.997580	.999078	4.00440E-02	.9969262	.9950146	1.35351	2774.2709	1857.1201	2400.8972	42.4016
26	.86229	3.9654E-03	.980294	.989466	5.05337E-02	.9790311	.9593915	1.33605	2726.1983	1839.2520	2367.1114	41.4097
27	.89768	4.2890E-03	.906029	.946628	9.35702E-02	.9041706	.8174643	1.26050	2519.6680	1759.6243	2225.7747	37.4578
28	.93496	4.6253E-03	.778438	.874404	1.42567E-01	.7838844	.6041068	1.12369	2164.8366	1625.3717	1998.6742	31.5170
29	.97544	4.9743E-03	.634842	.788376	1.62783E-01	.6476481	.4106420	.96161	1765.4959	1465.4591	1741.4601	26.1301
30	.99631	5.1458E-03	.562816	.741958	1.63841E-01	.5776323	.3301808	.87690	1565.1923	1379.1768	1609.2701	23.8897
31	1.01590	5.3004E-03	.497659	.697916	1.60664E-01	.5133627	.2656992	.79775	1383.9885	1297.3103	1487.9291	22.0942
32	1.03212	5.4233E-03	.446074	.661545	1.55691E-01	.4618689	.2198088	.73308	1240.5319	1229.7016	1390.7088	20.8165
33	1.03905	5.4743E-03	.424802	.646137	1.53061E-01	.4404846	.2021414	.70581	1181.3755	1201.0605	1350.3352	20.3245
34	1.04611	5.5252E-03	.403613	.630543	1.50104E-01	.4190956	.1852464	.67826	1122.4468	1172.0745	1309.9528	19.8541
35	1.05331	5.5761E-03	.382517	.614770	1.46831E-01	.3977170	.1691104	.65043	1063.7792	1142.7547	1269.5899	19.4048
36	1.06068	5.6271E-03	.361525	.598823	1.43254E-01	.3763625	.1537198	.62229	1005.4020	1113.1116	1229.2726	18.9762
37	1.06823	5.6780E-03	.340647	.582706	1.39381E-01	.3550445	.1390607	.59384	947.3398	1083.1541	1189.0243	18.5681
38	1.07598	5.7290E-03	.319889	.566425	1.35220E-01	.3337736	.1251193	.56504	889.6115	1052.8892	1148.8648	18.1799
39	1.08395	5.7799E-03	.299255	.549980	1.30777E-01	.3125579	.1118819	.53589	832.2288	1022.3208	1108.8095	17.8113
40	1.09218	5.8308E-03	.278747	.533371	1.26056E-01	.2914024	.0993353	.50633	775.1947	991.4486	1068.8678	17.4619
41	1.10070	5.8818E-03	.258361	.516596	1.21058E-01	.2703083	.0874672	.47632	718.5012	960.2665	1029.0422	17.1315
42	1.10955	5.9327E-03	.238089	.499647	1.15780E-01	.2492717	.0762661	.44581	662.1259	928.7604	989.3252	16.8196
43	1.11879	5.9837E-03	.217917	.482510	1.10215E-01	.2282821	.0657218	.41471	606.0275	896.9050	949.6968	16.5260
44	1.12849	6.0346E-03	.197820	.465162	1.04347E-01	.2073196	.0558260	.38293	550.1381	864.6591	910.1196	16.2504
45	1.13874	6.0855E-03	.177760	.447570	9.81528E-02	.1863512	.0465723	.35032	494.3519	831.9586	870.5312	15.9928
46	1.14967	6.1365E-03	.157678	.429672	9.15907E-02	.1653549	.0379572	.31655	438.5039	798.6884	830.8902	15.7529
47	1.16148	6.1874E-03	.137477	.411436	8.45917E-02	.1441068	.0299788	.28204	382.3244	764.7908	790.7737	15.5307
48	1.17446	6.2384E-03	.116990	.392804	7.70323E-02	.1227353	.0226307	.24564	325.3495	730.1563	750.4244	15.3261
49	1.18911	6.2893E-03	.095912	.373523	6.86724E-02	.1009771	.0159252	.20651	266.7305	694.3174	709.3448	15.1394
50	1.20643	6.3402E-03	.073569	.353058	5.89425E-02	.0782671	.0098731	.16293	204.5941	656.2759	666.4683	14.9709
51	1.22951	6.3912E-03	.047155	.329171	4.52773E-02	.0522055	.0043344	.10816	131.1372	611.8743	617.2641	14.8167
52	1.30277	6.4421E-03	.009199	.293308	1.74546E-02	.0143820	.0001846	.02235	25.5820	545.2104	545.8532	14.7011
53	1.37213	6.4931E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (33) X= 1.00000 PRESSURE= 14.6960

		*		** DIMENSIONLESS		**		**		** DIMENSIONAL	**	*
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
14	.44828	1.0723E-03	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
15	.48276	1.2436E-03	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
16	.51724	1.4276E-03	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
17	.55172	1.6242E-03	1.000000	1.000000	3.73146E-02	.9989844	1.0006580	1.35621	2781.0000	1858.8333	2404.7831	42.5588
18	.58621	1.8336E-03	1.000000	1.000000	3.73146E-02	.9989844	1.0006579	1.35621	2781.0000	1858.8333	2404.7832	42.5588
19	.62069	2.0557E-03	1.000000	1.000000	3.73146E-02	.9989845	1.0006577	1.35621	2781.0000	1858.8337	2404.7835	42.5587
20	.65517	2.2904E-03	1.000000	1.000002	3.73147E-02	.9989862	1.0006552	1.35621	2781.0000	1858.8370	2404.7866	42.5587
21	.68966	2.5379E-03	.999998	1.000021	3.73152E-02	.9990028	1.0006214	1.35619	2780.9935	1858.8732	2404.8180	42.5577
22	.72414	2.7980E-03	.999936	1.000071	3.73231E-02	.9990133	1.0003757	1.35608	2780.8218	1858.9652	2404.8378	42.5509
23	.75863	3.0708E-03	.999449	.999932	3.74380E-02	.9986131	.9991748	1.35551	2779.4690	1858.7075	2404.0821	42.5175
24	.79316	3.3564E-03	.996021	.998273	3.88893E-02	.9952104	.9916815	1.35190	2769.9349	1855.6233	2397.6579	42.3088
25	.82787	3.6546E-03	.970659	.987795	5.08250E-02	.9754614	.9515405	1.33214	2716.0876	1836.1462	2360.3717	41.1911
26	.86325	3.9654E-03	.915558	.953905	8.75374E-02	.9149142	.8322818	1.26895	2545.6110	1773.1513	2246.0585	37.8704
27	.90005	4.2890E-03	.822313	.902949	1.27321E-01	.8276807	.6695171	1.16943	2286.8512	1678.4314	2081.3616	33.3383
28	.93901	4.6253E-03	.716742	.842720	1.50588E-01	.7287843	.5119193	1.05254	1993.2589	1566.4764	1894.6453	28.9501
29	.98088	4.9743E-03	.602671	.772852	1.58723E-01	.6196615	.3706238	.92136	1676.0280	1436.6031	1688.6213	25.0158
30	1.00219	5.1458E-03	.546217	.736003	1.58053E-01	.5645948	.3105250	.85423	1519.0293	1368.1070	1584.6554	23.3424
31	1.02198	5.3004E-03	.495435	.701480	1.55142E-01	.5144601	.2614411	.79231	1377.8034	1303.9342	1490.0010	21.9757
32	1.03815	5.4233E-03	.455537	.673240	1.51428E-01	.4744722	.2258033	.74223	1266.2921	1251.4411	1414.5038	20.9834
33	1.04499	5.4743E-03	.438812	.661339	1.49556E-01	.4578909	.2118816	.72125	1220.3358	1229.3188	1383.1982	20.5957
34	1.05192	5.5252E-03	.422552	.649329	1.47494E-01	.4413159	.1984465	.70013	1174.5621	1206.9938	1351.9047	20.2216
35	1.05895	5.5761E-03	.405965	.637213	1.45247E-01	.4247550	.1854906	.67889	1128.9895	1184.4736	1320.6377	19.8609
36	1.06608	5.6271E-03	.389657	.624997	1.42820E-01	.4082156	.1730061	.65750	1083.6353	1161.7652	1289.4113	19.5133
37	1.07332	5.6780E-03	.373432	.612683	1.40221E-01	.3917049	.1609850	.63598	1038.5153	1138.8757	1258.2390	19.1785
38	1.08068	5.7290E-03	.357297	.600275	1.37452E-01	.3752293	.1494193	.61432	993.6436	1115.8118	1227.1332	18.8565
39	1.08816	5.7799E-03	.341256	.587777	1.34520E-01	.3587951	.1383010	.59251	949.0327	1092.5798	1196.1054	18.5469
40	1.09579	5.8308E-03	.325312	.575192	1.31429E-01	.3424077	.1276222	.57053	904.6929	1069.1852	1165.1659	18.2496
41	1.10358	5.8818E-03	.309469	.562521	1.28181E-01	.3260717	.1173749	.54840	860.6324	1045.6329	1134.3236	17.9642
42	1.11153	5.9327E-03	.293728	.549768	1.24780E-01	.3097911	.1075515	.52608	816.8566	1021.9267	1103.5857	17.6907
43	1.11966	5.9837E-03	.278090	.536933	1.21229E-01	.2935686	.0981445	.50357	773.3677	998.0687	1072.9576	17.4288
44	1.12800	6.0346E-03	.262555	.524017	1.17528E-01	.2774058	.0891468	.48085	730.1646	974.0595	1042.4422	17.1782
45	1.13657	6.0855E-03	.247120	.511018	1.13679E-01	.2613027	.0805514	.45790	687.2415	949.8973	1012.0397	16.9389
46	1.14539	6.1365E-03	.231783	.497935	1.09680E-01	.2452576	.0723522	.43469	644.5876	925.5773	981.7465	16.7106
47	1.15449	6.1874E-03	.216536	.484762	1.05529E-01	.2292664	.0645431	.41119	602.1854	901.0910	951.5552	16.4932
48	1.16392	6.2384E-03	.201370	.471492	1.01222E-01	.2133222	.0571192	.38736	560.0092	876.4249	921.4525	16.2865
49	1.17372	6.2893E-03	.186272	.458115	9.67507E-02	.1974142	.0500758	.36314	518.0226	851.5589	891.4181	16.0903
50	1.18396	6.3402E-03	.171224	.444614	9.21046E-02	.1815259	.0434096	.33848	476.1744	826.4624	861.4209	15.9047

PROFILES-- STA (33)   X= 1.00000   PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL T	TOT **	PTOT *
51	1.19471	6.3912E-03	.156201	.430960	8.72674E-02	.1656285	.0371188	.31329	434.3939	801.0825	831.4067	15.7296
52	1.20607	6.4421E-03	.141164	.417150	8.22145E-02	.1496775	.0312000	.28762	392.5782	775.4126	801.2911	15.5647
53	1.21819	6.4931E-03	.126059	.403185	7.69079E-02	.1336886	.0256494	.26125	350.5712	749.4542	771.1041	15.4102
54	1.23126	6.5440E-03	.110801	.388999	7.12875E-02	.1176372	.0204690	.23378	308.1365	723.0840	740.7992	15.2659
55	1.24560	6.5944E-03	.095254	.374474	6.52545E-02	.1014023	.0156650	.20484	264.9019	696.0851	710.1477	15.1322
56	1.26173	6.6459E-03	.079184	.359410	5.86296E-02	.0847761	.0112460	.17381	220.2108	668.0839	678.7573	15.0091
57	1.28064	6.6968E-03	.062074	.343385	5.10228E-02	.0673217	.0072141	.13940	172.6276	638.2962	645.8033	14.8969
58	1.30510	6.7478E-03	.042097	.324973	4.10027E-02	.0475409	.0034972	.09718	117.0720	604.0701	608.4572	14.7934
59	1.36312	6.7987E-03	.012042	.297579	1.98020E-02	.0186975	.0003118	.02905	33.4882	553.1504	554.0010	14.7047
60	7.90138	6.8496E-03	.000022	.279083	6.64854E-04	.0000370	.0000000	.00005	.0613	518.7691	518.7699	14.6960
61	11.09079	6.9006E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (37) X= 2.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THO	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
1	0.00000	0.	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
2	.03448	6.5447E-06	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	3.37226E-02	.9987639	1.0006580	1.35621	2781.0000	1858.8333	2404.3669	42.5588
12	.37931	7.6771E-04	1.000000	1.000000	3.37226E-02	.9987640	1.0006579	1.35621	2781.0000	1858.8333	2404.3670	42.5588
13	.41379	9.1364E-04	1.000000	1.000000	3.37226E-02	.9987641	1.0006578	1.35621	2781.0000	1858.8336	2404.3672	42.5588
14	.44828	1.0723E-03	1.000000	1.000001	3.37226E-02	.9987647	1.0006568	1.35621	2781.0000	1858.8349	2404.3685	42.5587
15	.48276	1.2436E-03	1.000000	1.000005	3.37227E-02	.9987685	1.0006511	1.35621	2781.0000	1858.8425	2404.3755	42.5586
16	.51724	1.4276E-03	.999995	1.000026	3.37229E-02	.9987851	1.0006067	1.35619	2780.9856	1858.8820	2404.4069	42.5573
17	.53820	1.5456E-03	.999979	1.000039	3.37259E-02	.9987876	1.0005425	1.35616	2780.9406	1858.9058	2404.4116	42.5555
18	.55838	1.6636E-03	.999940	1.000043	3.37271E-02	.9987693	1.0004278	1.35610	2780.8344	1858.9129	2404.3771	42.5523
19	.57785	1.7817E-03	.999852	1.000023	3.37576E-02	.9987012	1.0002017	1.35600	2780.5888	1858.8767	2404.2484	42.5461
20	.59668	1.8997E-03	.999656	.999952	3.37699E-02	.9985239	.9997391	1.35578	2780.0429	1858.7432	2403.9138	42.5332
21	.61495	2.0177E-03	.999237	.999769	3.38638E-02	.9981201	.9987941	1.35532	2778.8787	1858.4035	2403.1514	42.5069
22	.63269	2.1358E-03	.998372	.999359	3.41280E-02	.9972611	.9968883	1.35441	2776.4738	1857.6423	2401.5296	42.4538
23	.64996	2.2538E-03	.996664	.998515	3.48130E-02	.9955427	.9931797	1.35262	2771.7231	1856.0730	2398.2853	42.3505
24	.66681	2.3718E-03	.993440	.996886	3.64747E-02	.9922955	.9862530	1.34927	2762.7553	1853.0448	2392.1545	42.1577
25	.68327	2.4899E-03	.987810	.994008	3.99373E-02	.9866570	.9742854	1.34343	2747.1007	1847.6948	2381.5090	41.8244
26	.69941	2.6079E-03	.978943	.989457	4.60333E-02	.9778831	.9556534	1.33421	2722.4417	1839.2362	2364.9439	41.3056
27	.71526	2.7259E-03	.966651	.983140	5.46286E-02	.9658930	.9302276	1.32139	2688.2560	1827.4927	2342.3066	40.5977
28	.73088	2.8440E-03	.951384	.975293	6.48842E-02	.9512330	.8992754	1.30537	2645.7975	1812.9064	2314.6285	39.7358
29	.74630	2.9620E-03	.933870	.966275	7.57001E-02	.9346397	.8646282	1.28689	2597.0920	1796.1447	2283.3004	38.7711
30	.76156	3.0800E-03	.914734	.956383	8.63040E-02	.9166930	.8278231	1.26656	2543.8755	1777.7573	2249.4170	37.7463
31	.77668	3.1981E-03	.894425	.945824	9.62879E-02	.8977849	.7899513	1.24485	2487.3973	1758.1283	2213.7185	36.6917
32	.79169	3.3161E-03	.873256	.934727	1.05435E-01	.8761605	.7517640	1.22207	2428.5251	1737.5022	2176.6675	35.6284
33	.80660	3.4341E-03	.851436	.923176	1.13670E-01	.8579726	.7137562	1.19844	2367.8422	1716.0311	2138.5529	34.5701
34	.82143	3.5522E-03	.829113	.911224	1.20989E-01	.8373237	.6762657	1.17411	2305.7630	1693.8127	2099.5677	33.5262
35	.83620	3.6702E-03	.806400	.898904	1.27416E-01	.8162866	.6395284	1.14920	2242.5974	1670.9122	2059.8445	32.5033
36	.85093	3.7882E-03	.783383	.886241	1.32995E-01	.7949171	.6037108	1.12378	2178.5875	1647.3751	2019.5039	31.5060
37	.86562	3.9063E-03	.760134	.873256	1.37773E-01	.7732614	.5689310	1.09794	2113.9317	1623.2366	1978.6181	30.5376
38	.88029	4.0243E-03	.736713	.859962	1.41796E-01	.7513599	.5352715	1.07173	2048.7981	1598.5253	1937.2679	29.6003
39	.89496	4.1423E-03	.713172	.846373	1.45111E-01	.7292487	.5027881	1.04519	1983.3326	1573.2662	1895.5220	28.6959
40	.90963	4.2604E-03	.689559	.832502	1.47762E-01	.7069616	.4715157	1.01838	1917.6647	1547.4827	1853.4440	27.8251
41	.92432	4.3784E-03	.665915	.818362	1.49790E-01	.6845305	.4414731	.99132	1851.9109	1521.1976	1811.0940	26.9886
42	.93905	4.4964E-03	.642279	.803963	1.51233E-01	.6619860	.4126664	.96406	1786.1774	1494.4338	1768.5300	26.1865
43	.95381	4.6145E-03	.618685	.789320	1.52127E-01	.6393580	.3850920	.93661	1720.5628	1467.2147	1725.8082	25.4187
44	.96864	4.7325E-03	.595167	.774445	1.52506E-01	.6166752	.3587384	.90901	1655.1587	1439.5646	1682.9832	24.6849
45	.98354	4.8505E-03	.571755	.759352	1.52400E-01	.5939656	.3335880	.88128	1590.0503	1411.5086	1640.1075	23.9846
46	.99852	4.9686E-03	.548478	.744054	1.51839E-01	.5712559	.3096182	.85344	1525.3171	1383.0721	1597.2316	23.3171
47	1.01360	5.0866E-03	.525362	.728565	1.50848E-01	.5485714	.2868020	.82550	1461.0317	1354.2809	1554.4031	22.6818
48	1.02879	5.2046E-03	.502431	.712899	1.49453E-01	.5259358	.2651093	.79749	1397.2603	1325.1606	1511.6671	22.0778
49	1.04412	5.3227E-03	.479706	.697070	1.47677E-01	.5033718	.2445075	.76941	1334.0628	1295.7371	1469.0663	21.5042
50	1.05959	5.4407E-03	.457207	.681092	1.45543E-01	.4809009	.2249622	.74127	1271.4930	1266.0362	1426.6412	20.9599

PROFILES-- STA (37) X= 2.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
				** DIMENSIONLESS **				**	** DIMENSIONAL **			
51	1.07523	5.5587E-03	.434951	.664978	1.43073E-01	.4585436	.2064380	.71308	1209.5993	1236.0840	1384.4306	20.4442
52	1.09105	5.6768E-03	.412954	.648744	1.40286E-01	.4363191	.1888996	.68484	1148.4247	1205.9065	1342.4707	19.9559
53	1.10709	5.7948E-03	.391229	.632402	1.37202E-01	.4142456	.1723113	.65655	1088.0072	1175.5293	1300.7959	19.4939
54	1.12337	5.9128E-03	.369788	.615966	1.33840E-01	.3923397	.1566383	.62821	1028.3794	1144.9776	1259.4376	19.0575
55	1.13991	6.0309E-03	.348640	.599449	1.30215E-01	.3706165	.1418463	.59982	969.5686	1114.2752	1218.4243	18.6456
56	1.15675	6.1489E-03	.327794	.582863	1.26345E-01	.3490894	.1279022	.57136	911.5960	1083.4446	1177.7810	18.2574
57	1.17394	6.2669E-03	.307255	.566219	1.22242E-01	.3277693	.1147739	.54282	854.4765	1052.5058	1137.5286	17.8918
58	1.19151	6.3850E-03	.287026	.549525	1.17918E-01	.3066649	.1024310	.51418	798.2179	1021.4759	1097.6835	17.5481
59	1.20951	6.5030E-03	.267105	.532790	1.13385E-01	.2857818	.0908440	.48543	742.8199	990.3680	1058.2561	17.2255
60	1.22802	6.6210E-03	.247491	.516017	1.08649E-01	.2651220	.0799856	.45652	688.2724	959.1902	1019.2506	16.9232
61	1.24712	6.7391E-03	.228175	.499207	1.03717E-01	.2446835	.0698298	.42742	634.5537	927.9435	980.6627	16.6404
62	1.26689	6.8571E-03	.209143	.482356	9.85913E-02	.2244584	.0603526	.39807	581.6278	896.6198	942.4777	16.3765
63	1.28746	6.9751E-03	.190377	.465452	9.32710E-02	.2044316	.0515322	.36841	529.4394	865.1981	904.6670	16.1309
64	1.30899	7.0932E-03	.171848	.448474	8.77500E-02	.1845771	.0433490	.33835	477.9079	833.6380	867.1816	15.9030
65	1.33169	7.2112E-03	.153513	.431360	8.20152E-02	.1648496	.0357867	.30776	426.9186	801.8632	829.9361	15.6925
66	1.35586	7.3292E-03	.135311	.414160	7.60417E-02	.1451828	.0288289	.27669	376.3002	769.8547	792.8052	15.4987
67	1.38190	7.4473E-03	.117147	.396803	6.97827E-02	.1255971	.0224602	.24473	325.7859	737.5910	755.8275	15.3214
68	1.41051	7.5653E-03	.098870	.379189	6.31490E-02	.1060067	.0166783	.21129	274.9581	704.8484	718.8408	15.1604
69	1.44283	7.6833E-03	.080225	.361096	5.59523E-02	.0861789	.0114917	.17569	223.1066	671.2179	681.4058	15.0160
70	1.48118	7.8014E-03	.060652	.342081	4.76888E-02	.0656411	.0069122	.13646	168.6733	635.8711	642.6304	14.8885
71	1.53301	7.9194E-03	.037735	.320107	3.57075E-02	.0422163	.0028515	.08777	104.9423	595.0259	598.4045	14.7754
72	1.71678	8.0374E-03	.006347	.288889	1.23809E-02	.0098619	.0000892	.01554	17.6518	536.9973	537.3193	14.6985
73	18.63027	8.1555E-03	.000009	.279063	3.81685E-04	.0000170	.0000000	.00002	.0250	518.7317	518.7320	14.6960
74	26.29119	8.2735E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- S1A (38)   X= 2.50000   PRESSURE= 14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
			** DIMENSIONLESS					**		** DIMENSIONAL	**	
1	0.00000	0.	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
7	.20690	2.2841E-04	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
8	.24138	3.1089E-04	1.000000	1.000000	3.25822E-02	.9986986	1.0006580	1.35621	2781.0000	1858.8333	2404.2436	42.5588
9	.27586	4.0606E-04	1.000000	1.000000	3.25822E-02	.9986986	1.0006579	1.35621	2781.0000	1858.8333	2404.2436	42.5588
10	.31034	5.1392E-04	1.000000	1.000000	3.25822E-02	.9986987	1.0006578	1.35621	2781.0000	1858.8335	2404.2438	42.5588
11	.34483	6.3447E-04	1.000000	1.000000	3.25822E-02	.9986991	1.0006573	1.35621	2781.0000	1858.8342	2404.2444	42.5587
12	.37931	7.6771E-04	1.000000	1.000002	3.25822E-02	.9987005	1.0006551	1.35621	2781.0000	1858.8371	2404.2472	42.5587
13	.41379	9.1364E-04	1.000000	1.000008	3.25822E-02	.9987063	1.0006464	1.35621	2781.0000	1858.8487	2404.2580	42.5584
14	.44828	1.0723E-03	.999989	1.000030	3.25826E-02	.9987200	1.0005856	1.35618	2780.9702	1858.8889	2404.2839	42.5567
15	.48276	1.2436E-03	.999945	1.000039	3.25848E-02	.9987032	1.0004451	1.35611	2780.8465	1858.9064	2404.2522	42.5528
16	.51725	1.4276E-03	.999774	.999990	3.26000E-02	.9985603	1.0000252	1.35591	2780.3723	1858.8144	2403.9824	42.5411
17	.53821	1.5456E-03	.999449	.999851	3.26492E-02	.9982481	.9992868	1.35556	2779.4682	1858.5564	2403.3930	42.5206
18	.55840	1.6636E-03	.998760	.999531	3.28030E-02	.9975653	.9977593	1.35483	2777.5520	1857.9610	2402.1040	42.4780
19	.57789	1.7817E-03	.997348	.998848	3.32591E-02	.9961506	.9946710	1.35334	2773.6254	1856.6914	2399.4330	42.3921
20	.59676	1.8997E-03	.994603	.997492	3.44875E-02	.9933989	.9887237	1.35047	2765.9918	1854.1720	2394.2378	42.2265
21	.61509	2.0177E-03	.989667	.995027	3.73427E-02	.9884814	.9781257	1.34531	2752.2630	1849.5893	2384.9535	41.9314
22	.63295	2.1358E-03	.981750	.991050	4.27190E-02	.9806857	.9613213	1.33704	2730.2471	1842.1968	2370.2353	41.4634
23	.65040	2.2538E-03	.970709	.985487	5.06577E-02	.9699697	.9382287	1.32546	2699.5412	1831.8555	2350.0035	40.8204
24	.66750	2.3718E-03	.957102	.978613	6.01898E-02	.9569522	.9103025	1.31114	2661.7001	1819.0788	2325.4263	40.0429
25	.68430	2.4899E-03	.941651	.970780	7.02235E-02	.9423476	.8792976	1.29480	2618.7309	1804.5187	2297.8528	39.1795
26	.70084	2.6079E-03	.924905	.962249	8.00648E-02	.9266641	.8465334	1.27701	2572.1599	1788.6605	2268.2425	38.2672
27	.71715	2.7259E-03	.907227	.953187	8.93660E-02	.9102178	.8128824	1.25812	2522.9982	1771.8161	2237.1918	37.3303
28	.73326	2.8440E-03	.888859	.943701	9.79744E-02	.8932051	.7789205	1.23839	2471.9181	1754.1834	2205.0719	36.3846
29	.74919	2.9620E-03	.869970	.933861	1.05836E-01	.8757541	.7450401	1.21800	2419.3861	1735.8919	2172.1242	35.4412
30	.76496	3.0800E-03	.850680	.923714	1.12946E-01	.8579526	.7115163	1.19706	2365.7422	1717.0297	2138.5151	34.5078
31	.78059	3.1981E-03	.831084	.913293	1.19325E-01	.8398648	.6785459	1.17566	2311.2445	1697.6588	2104.3652	33.5897
32	.79611	3.3161E-03	.811254	.902623	1.25001E-01	.8215395	.6462712	1.15390	2256.0969	1677.8250	2069.7670	32.6911
33	.81151	3.4341E-03	.791249	.891722	1.30012E-01	.8030159	.6147952	1.13182	2200.4644	1657.5630	2034.7945	31.8146
34	.82683	3.5522E-03	.771120	.880606	1.34595E-01	.7843266	.5841912	1.10948	2144.4846	1636.9004	1999.5091	30.9625
35	.84207	3.6702E-03	.750908	.869287	1.38185E-01	.7654997	.5545103	1.08691	2088.2744	1615.8602	1963.9659	30.1360
36	.85725	3.7882E-03	.730649	.857776	1.41418E-01	.7465601	.5257861	1.06416	2031.9347	1594.4620	1928.2060	29.3362
37	.87237	3.9063E-03	.710375	.846081	1.44128E-01	.7275303	.4980386	1.04126	1975.5540	1572.7236	1892.2777	28.5636
38	.88745	4.0243E-03	.690115	.834212	1.46346E-01	.7084310	.4712771	1.01823	1919.2106	1550.6614	1856.2183	27.8184
39	.90251	4.1423E-03	.669894	.822178	1.48102E-01	.6892817	.4455024	.99509	1862.9748	1528.2909	1820.0642	27.1008
40	.91754	4.2604E-03	.649734	.809985	1.49424E-01	.6701004	.4207087	.97187	1806.9098	1505.6276	1783.8501	26.4104
41	.93257	4.3784E-03	.629656	.797644	1.50338E-01	.6509046	.3968845	.94858	1751.0731	1482.6864	1747.6084	25.7470
42	.94760	4.4964E-03	.609679	.785161	1.50868E-01	.6317107	.3740145	.92525	1695.5169	1459.4826	1711.3703	25.1102
43	.96264	4.6145E-03	.589820	.772544	1.51037E-01	.6125345	.3520800	.90188	1640.2889	1436.0314	1675.1656	24.4995
44	.97770	4.7325E-03	.570095	.759804	1.50867E-01	.5933910	.3310596	.87848	1585.4330	1412.3483	1639.0226	23.9142
45	.99280	4.8505E-03	.550518	.746946	1.50376E-01	.5742947	.3109304	.85507	1530.9892	1388.4488	1602.9688	23.3537
46	1.00794	4.9686E-03	.531102	.733981	1.49585E-01	.5552595	.2916678	.83166	1476.9941	1364.3488	1567.0303	22.8173
47	1.02313	5.0866E-03	.511860	.720917	1.48511E-01	.5362984	.2732466	.80824	1423.4813	1340.0642	1531.2318	22.3044
48	1.03839	5.2046E-03	.492802	.707762	1.47171E-01	.5174243	.2556407	.78484	1370.4813	1315.6109	1495.5973	21.8142
49	1.05373	5.3227E-03	.473938	.694524	1.45580E-01	.4986489	.2388240	.76145	1318.0218	1291.0051	1460.1494	21.3459
50	1.06916	5.4407E-03	.455278	.681214	1.43753E-01	.4799837	.2227703	.73808	1266.1279	1266.2628	1424.9095	20.8989

PROFILES-- STA (38)   X=   2.50000   PRESSURE=   14.6960

N	Y	PSI*	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT*
				** DIMENSIONLESS **				**		** DIMENSIONAL **		
51	1.08470	5.5587E-03	.436829	.667838	1.41704E-01	.4614393	.2074536	.71473	1214.8218	1241.3998	1389.8977	20.4724
52	1.10035	5.6768E-03	.418599	.654406	1.39447E-01	.4430259	.1928482	.69140	1164.1234	1216.4318	1355.1331	20.0658
53	1.11613	5.7948E-03	.400593	.640926	1.36993E-01	.4247526	.1789290	.66810	1114.0498	1191.3741	1320.6331	19.6782
54	1.13207	5.9128E-03	.382818	.627405	1.34354E-01	.4066281	.1656713	.64481	1064.6157	1166.2417	1286.4141	19.3090
55	1.14817	6.0309E-03	.365276	.613852	1.31541E-01	.3886602	.1530512	.62154	1015.8332	1141.0489	1252.4907	18.9576
56	1.16446	6.1489E-03	.347973	.600274	1.28565E-01	.3708559	.1410456	.59829	967.7119	1115.8093	1218.8761	18.6233
57	1.18095	6.2669E-03	.330909	.586678	1.25433E-01	.3532212	.1296322	.57504	920.2585	1090.5359	1185.5819	18.3055
58	1.19768	6.3850E-03	.314087	.573069	1.22156E-01	.3357614	.1187895	.55180	873.4771	1065.2403	1152.6177	18.0036
59	1.21467	6.5030E-03	.297508	.559455	1.18739E-01	.3184806	.1084971	.52854	827.3687	1039.9333	1119.9915	17.7170
60	1.23194	6.6210E-03	.281169	.545839	1.15191E-01	.3013818	.0987352	.50527	781.9312	1014.6238	1087.7090	17.4452
61	1.24955	6.7391E-03	.265070	.532226	1.11518E-01	.2844667	.0894854	.48197	737.1592	989.3191	1055.7733	17.1877
62	1.26751	6.8571E-03	.249207	.518618	1.07723E-01	.2677357	.0807300	.45861	693.0433	964.0246	1024.1851	16.9439
63	1.28589	6.9751E-03	.233574	.505017	1.03811E-01	.2511874	.0724523	.43519	649.5697	938.7426	992.9419	16.7134
64	1.30474	7.0932E-03	.218166	.491423	9.97839E-02	.2348185	.0646371	.41167	606.7195	913.4726	962.0374	16.4958
65	1.32412	7.2112E-03	.202973	.477832	9.56426E-02	.2186234	.0572698	.38802	564.4681	888.2098	931.4611	16.2906
66	1.34412	7.3292E-03	.187984	.464240	9.13858E-02	.2025936	.0503374	.36422	522.7829	862.9446	901.1969	16.0976
67	1.36482	7.4473E-03	.173183	.450638	8.70095E-02	.1867173	.0438278	.34022	481.6226	837.6612	871.2223	15.9164
68	1.38637	7.5653E-03	.158552	.437014	8.25068E-02	.1709788	.0377306	.31595	440.9334	812.3371	841.5080	15.7466
69	1.40890	7.6833E-03	.144065	.423357	7.78660E-02	.1553582	.0320361	.29137	400.6435	786.9496	812.0163	15.5880
70	1.43263	7.8014E-03	.129684	.409673	7.30678E-02	.1398028	.0267346	.26663	360.6510	761.5133	782.6477	15.4404
71	1.45786	7.9194E-03	.115358	.395952	6.80816E-02	.1243777	.0218170	.24125	320.8099	736.0094	753.5252	15.3035
72	1.48497	8.0374E-03	.101010	.382130	6.28590E-02	.1090111	.0172809	.21503	280.9090	710.3159	724.5131	15.1772
73	1.51461	8.1555E-03	.086525	.368104	5.73198E-02	.0935947	.0131269	.18767	240.6248	684.2437	695.4069	15.0615
74	1.54779	8.2735E-03	.071700	.353699	5.13199E-02	.0779456	.0093578	.15865	199.3985	657.4666	665.8613	14.9566
75	1.58649	8.3915E-03	.056113	.338552	4.45510E-02	.0616897	.0059742	.12691	156.0490	629.3110	635.1702	14.8623
76	1.63593	8.5096E-03	.038409	.321559	3.59677E-02	.0436825	.0029410	.08913	106.8153	597.7250	601.1727	14.7779
77	1.74092	8.6276E-03	.012553	.297278	1.79572E-02	.0183335	.0003392	.03030	34.9096	552.5895	553.3136	14.7054
78	4.26846	8.7456E-03	.000207	.279628	2.40221E-03	.0005790	.0000001	.00052	.5762	519.7820	519.7932	14.6960
79	5.78002	8.8637E-03	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (40) X= 3.40000 PRESSURE= 14.6960

		*		** DIMENSIONLESS		**		**		** DIMENSIONAL	**	*
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	1.000000	1.000000	3.10543E-02	.9986146	1.0006580	1.35621	2781.0000	1858.8333	2404.0850	42.5588
2	.03448	6.3447E-06	1.000000	1.000000	3.10543E-02	.9986146	1.0006580	1.35621	2781.0000	1858.8333	2404.0850	42.5588
3	.06897	2.5379E-05	1.000000	1.000000	3.10543E-02	.9986146	1.0006579	1.35621	2781.0000	1858.8333	2404.0850	42.5588
4	.10345	5.7102E-05	1.000000	1.000000	3.10543E-02	.9986146	1.0006579	1.35621	2781.0000	1858.8334	2404.0851	42.5588
5	.13793	1.0152E-04	1.000000	1.000000	3.10543E-02	.9986147	1.0006578	1.35621	2781.0000	1858.8336	2404.0853	42.5588
6	.17241	1.5862E-04	1.000000	1.000000	3.10543E-02	.9986151	1.0006573	1.35621	2781.0000	1858.8342	2404.0859	42.5587
7	.20690	2.2841E-04	1.000000	1.000002	3.10543E-02	.9986162	1.0006556	1.35621	2781.0000	1858.8364	2404.0879	42.5587
8	.24138	3.1084E-04	1.000000	1.000006	3.10543E-02	.9986199	1.0006500	1.35621	2781.0000	1858.8439	2404.0950	42.5585
9	.27586	4.0606E-04	.999995	1.000019	3.10544E-02	.9986290	1.0006182	1.35619	2780.9866	1858.8680	2404.1122	42.5576
10	.31035	5.1392E-04	.999977	1.000028	3.10551E-02	.9986276	1.0005536	1.35616	2780.9369	1858.8859	2404.1096	42.5559
11	.34483	6.3447E-04	.999920	1.000021	3.10585E-02	.9985882	1.0004002	1.35609	2780.7782	1858.8722	2404.0351	42.5516
12	.37932	7.6771E-04	.999743	.999957	3.10767E-02	.9984287	.9999804	1.35589	2780.2852	1858.7543	2403.7339	42.5399
13	.41275	9.0893E-04	.999231	.999733	3.11661E-02	.9979314	.9988258	1.35534	2778.8606	1858.3361	2402.7951	42.5077
14	.44367	1.0502E-03	.997927	.999120	3.15376E-02	.9966374	.9959483	1.35395	2775.2358	1857.1968	2400.3521	42.4276
15	.47262	1.1914E-03	.994936	.997671	3.28320E-02	.9936580	.9894220	1.35081	2766.9161	1854.5048	2394.7270	42.2459
16	.49995	1.3326E-03	.988894	.994703	3.63997E-02	.9876819	.9763893	1.34446	2750.1139	1848.9873	2383.4440	41.8830
17	.52596	1.4736E-03	.978705	.989662	4.35310E-02	.9777429	.9547219	1.33376	2721.7794	1839.6159	2364.6792	41.2797
18	.55091	1.6150E-03	.964684	.982699	5.36629E-02	.9642973	.9254642	1.31897	2682.7859	1826.6738	2339.2939	40.4650
19	.57496	1.7563E-03	.948094	.974428	6.49241E-02	.9486285	.8916666	1.30139	2636.6504	1811.2993	2309.7113	39.5240
20	.59826	1.8975E-03	.929975	.965341	7.59829E-02	.9317049	.8557588	1.28210	2586.2611	1794.4073	2277.7594	38.5241
21	.62092	2.0387E-03	.910934	.955719	8.62747E-02	.9140542	.8191388	1.26171	2533.3067	1776.5218	2244.4349	37.5045
22	.64301	2.1799E-03	.891319	.945719	9.56199E-02	.8959588	.7825906	1.24059	2478.7586	1757.9343	2210.2706	36.4868
23	.66461	2.3211E-03	.871346	.935434	1.03996E-01	.8775800	.7465732	1.21897	2423.2131	1738.8153	2175.5716	35.4839
24	.68578	2.4624E-03	.851155	.924919	1.11443E-01	.8590170	.7113654	1.19700	2367.0624	1719.2711	2140.5247	34.5036
25	.70657	2.6036E-03	.830845	.914214	1.18019E-01	.8403354	.6771388	1.17478	2310.5792	1699.3713	2105.2537	33.5505
26	.72701	2.7446E-03	.810486	.903343	1.23792E-01	.8215809	.6439977	1.15238	2253.9614	1679.1641	2069.8453	32.6278
27	.74715	2.8860E-03	.790133	.892325	1.28826E-01	.8027877	.6120017	1.12987	2197.3585	1658.6842	2034.3636	31.7368
28	.76703	3.0272E-03	.769826	.881175	1.33182E-01	.7839820	.5811805	1.10728	2140.8863	1637.9580	1998.8585	30.8786
29	.78666	3.1685E-03	.749600	.869904	1.36914E-01	.7651852	.5515427	1.08466	2084.6367	1617.0065	1963.3702	30.0534
30	.80608	3.3097E-03	.729480	.858521	1.40073E-01	.7464153	.5230825	1.06203	2028.6846	1595.8472	1927.9326	29.2609
31	.82531	3.4509E-03	.709490	.847034	1.42704E-01	.7276878	.4957835	1.03942	1973.0915	1574.4956	1892.5750	28.5008
32	.84437	3.5921E-03	.689647	.835452	1.44849E-01	.7090163	.4696215	1.01683	1917.9091	1552.9654	1857.3232	27.7723
33	.86329	3.7333E-03	.669968	.823780	1.46545E-01	.6904132	.4445685	.99430	1863.1810	1531.2699	1822.2006	27.0748
34	.88208	3.8746E-03	.650466	.812026	1.47826E-01	.6718900	.4205919	.97183	1808.9446	1509.4215	1787.2287	26.4071
35	.90075	4.0158E-03	.631151	.800197	1.48722E-01	.6534570	.3976573	.94943	1755.2321	1487.4324	1752.4273	25.7685
36	.91934	4.1570E-03	.612036	.788298	1.49262E-01	.6351242	.3757290	.92711	1702.0714	1465.3148	1717.8148	25.1580
37	.93784	4.2982E-03	.593127	.776337	1.49470E-01	.6169005	.3547706	.90487	1649.4868	1443.0806	1683.4086	24.5744
38	.95628	4.4394E-03	.574433	.764319	1.49371E-01	.5987947	.3347455	.88273	1597.4994	1420.7419	1649.2248	24.0168
39	.97467	4.5807E-03	.555961	.752252	1.48986E-01	.5808149	.3156176	.86069	1546.1276	1398.3105	1615.2788	23.4842
40	.99303	4.7219E-03	.537716	.740141	1.48334E-01	.5629686	.2973511	.83875	1495.3874	1375.7985	1581.5850	22.9756
41	1.01136	4.8631E-03	.519702	.727993	1.47434E-01	.5452630	.2799110	.81691	1445.2926	1353.2178	1548.1570	22.4900
42	1.02969	5.0043E-03	.501926	.715815	1.46304E-01	.5277050	.2632634	.79518	1395.8548	1330.5802	1515.0073	22.0264
43	1.04803	5.1456E-03	.484388	.703612	1.44957E-01	.5103006	.2473754	.77355	1347.0842	1307.8975	1482.1479	21.5840
44	1.06638	5.2868E-03	.467094	.691391	1.43410E-01	.4930559	.2322151	.75204	1298.9688	1285.1811	1449.5898	21.1619
45	1.08477	5.4280E-03	.450045	.679159	1.41676E-01	.4759760	.2177519	.73062	1251.5754	1262.4426	1417.3431	20.7592
46	1.10321	5.5692E-03	.433243	.666920	1.39767E-01	.4590661	.2039564	.70932	1204.8490	1239.6929	1385.4172	20.3750
47	1.12171	5.7104E-03	.416689	.654681	1.37694E-01	.4423306	.1908002	.68812	1158.8132	1216.9430	1353.8205	20.0087
48	1.14029	5.8517E-03	.400385	.642448	1.35469E-01	.4257735	.1782565	.66701	1113.4704	1194.2031	1322.5607	19.6595
49	1.15896	5.9929E-03	.384330	.630225	1.33103E-01	.4093984	.1662993	.64601	1068.8212	1171.4834	1291.6445	19.3265
50	1.17774	6.1341E-03	.368524	.618019	1.30603E-01	.3932064	.1549042	.62510	1024.8651	1148.7934	1261.0776	19.0042

PROFILES-- STA (40) X= 3.40000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS TI	TTD **	PTD	MACH **	U	** DIMENSIONAL T	TOT **	PTOT*
51	1.19665	6.2753E-03	.352967	.605833	1.27979E-01	.3772059	.1440477	.60428	981.6002	1126.1420	1230.8650	18.7069
52	1.21571	6.4165E-03	.337657	.593672	1.25240E-01	.3613932	.1337075	.58354	939.0233	1103.5376	1201.0105	18.4190
53	1.23494	6.5578E-03	.322592	.581541	1.22391E-01	.3457716	.1238624	.56289	897.1296	1080.9879	1171.5170	18.1449
54	1.25436	6.6990E-03	.307772	.569443	1.19441E-01	.3303422	.1144923	.54230	855.9131	1058.4997	1142.3863	17.8840
55	1.27399	6.8402E-03	.293192	.557381	1.16394E-01	.3151053	.1055785	.52178	815.3662	1036.0792	1113.6189	17.6358
56	1.29387	6.9814E-03	.278849	.545359	1.13258E-01	.3000605	.0971023	.50131	775.4798	1013.7313	1085.2145	17.3998
57	1.31402	7.1226E-03	.264740	.533378	1.10035E-01	.2852070	.0890474	.48088	736.2431	991.4599	1057.1711	17.1755
58	1.33447	7.2639E-03	.250861	.521439	1.06731E-01	.2705430	.0813976	.46049	697.6434	969.2679	1029.4854	16.9625
59	1.35526	7.4051E-03	.237205	.509543	1.03349E-01	.2560660	.0741378	.44012	659.6663	947.1564	1002.1527	16.7603
60	1.37644	7.5463E-03	.223767	.497691	9.98921E-02	.2417724	.0672539	.41975	622.2947	925.1252	975.1664	16.5686
61	1.39806	7.6875E-03	.210539	.485881	9.63611E-02	.2276576	.0607328	.39938	585.5092	903.1719	948.5178	16.3871
62	1.42017	7.8287E-03	.197514	.474110	9.27572E-02	.2137161	.0545622	.37896	549.2872	881.2922	922.1961	16.2153
63	1.44263	7.9700E-03	.184683	.462375	8.90802E-02	.1999404	.0487308	.35850	513.6026	859.4788	896.1877	16.0529
64	1.46614	8.1112E-03	.172033	.450671	8.53282E-02	.1863218	.0432280	.33795	478.4245	837.7214	870.4757	15.8997
65	1.49018	8.2524E-03	.159553	.438988	8.14981E-02	.1728492	.0380446	.31728	443.7164	816.0057	845.0394	15.7553
66	1.51508	8.3936E-03	.147225	.427314	7.75843E-02	.1595235	.0331718	.29638	409.4340	794.3057	819.8805	15.6196
67	1.54097	8.5348E-03	.135031	.415659	7.35782E-02	.1462557	.0286019	.27561	375.5206	772.6409	794.8309	15.4924
68	1.56806	8.6761E-03	.122942	.404034	6.94665E-02	.1331451	.0243241	.25452	341.9007	751.0312	770.0781	15.3733
69	1.59660	8.8173E-03	.110922	.392408	6.52298E-02	.1201571	.0203340	.23302	308.4753	729.4210	745.5567	15.2622
70	1.62692	8.9585E-03	.098926	.380741	6.08392E-02	.1072462	.0166284	.21098	275.1127	707.7344	721.1808	15.1590
71	1.65952	9.0997E-03	.086885	.368974	5.62507E-02	.0943489	.0132060	.18823	241.6272	685.8619	696.8308	15.0637
72	1.69512	9.2409E-03	.074699	.357018	5.13934E-02	.0813710	.0100672	.16452	207.7370	663.6366	672.3285	14.9763
73	1.73495	9.3822E-03	.062194	.344720	4.61419E-02	.0681554	.0072140	.13940	172.9625	640.7764	647.3774	14.8969
74	1.78128	9.5234E-03	.049019	.331778	4.02310E-02	.0543916	.0046482	.11199	136.3227	616.7194	621.3914	14.8254
75	1.84008	9.6646E-03	.034035	.317294	3.27771E-02	.0391504	.0023395	.07951	94.6526	589.7959	592.6160	14.7611
76	1.95811	9.8058E-03	.012093	.296967	1.76189E-02	.0180114	.0003151	.02920	33.6311	552.0119	552.7055	14.7048
77	4.52068	9.9471E-03	.000227	.279680	2.50493E-03	.0006306	.0000001	.00057	.6323	519.8784	519.8906	14.6960
78	6.08596	1.0088E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (42) X= 4.36646 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT *
			** DIMENSIONLESS **					**		** DIMENSIONAL **		
1	0.00000	0.	.999999	1.000005	2.98661E-02	.9985559	1.0006500	1.35621	2780.9984	1858.8418	2403.9742	42.5585
2	.03448	6.3447E-06	.999999	1.000005	2.98661E-02	.9985559	1.0006500	1.35621	2780.9984	1858.8418	2403.9742	42.5585
3	.06897	2.5379E-05	.999998	1.000011	2.98661E-02	.9985616	1.0006369	1.35620	2780.9950	1858.8546	2403.9850	42.5582
4	.10345	5.7102E-05	.999990	1.000020	2.98664E-02	.9985646	1.0006001	1.35618	2780.9710	1858.8707	2403.9906	42.5571
5	.13793	1.0152E-04	.999969	1.000022	2.98675E-02	.9985546	1.0005372	1.35615	2780.9129	1858.8747	2403.9717	42.5554
6	.17242	1.5862E-04	.999915	1.000010	2.98721E-02	.9985123	1.0004003	1.35609	2780.7632	1858.8514	2403.8919	42.5516
7	.24410	3.1790E-04	.999489	.999838	2.99361E-02	.9981123	.9994172	1.35562	2779.5776	1858.5326	2403.1366	42.5242
8	.29910	4.7718E-04	.997909	.999105	3.03883E-02	.9965516	.9959150	1.35394	2775.1837	1857.1694	2400.1900	42.4267
9	.34552	6.3646E-04	.993406	.996933	3.25190E-02	.9920841	.9860944	1.34919	2762.6633	1853.1326	2391.7554	42.1532
10	.38654	7.9575E-04	.983532	.992096	3.89127E-02	.9823916	.9648853	1.33881	2735.2032	1844.1403	2373.4560	41.5627
11	.42385	9.5503E-04	.967746	.984320	5.02786E-02	.9671999	.9316724	1.32215	2691.3025	1829.6868	2344.7741	40.6379
12	.45845	1.1143E-03	.948360	.974738	6.35649E-02	.9489127	.8919951	1.30157	2637.4052	1811.8755	2310.2477	39.5331
13	.49095	1.2736E-03	.927443	.964320	7.62765E-02	.9294329	.8505190	1.27923	2579.2179	1792.5105	2273.4699	38.3782
14	.52179	1.4329E-03	.905931	.953510	8.76575E-02	.9095695	.8093266	1.25613	2519.3939	1772.4158	2235.9677	37.2312
15	.55125	1.5922E-03	.884259	.942501	9.76259E-02	.8896503	.7692816	1.23271	2459.1231	1751.9530	2198.3603	36.1162
16	.57957	1.7514E-03	.862637	.931387	1.06285E-01	.8698186	.7307501	1.20422	2398.9924	1731.2937	2160.9181	35.0433
17	.60691	1.9107E-03	.841178	.920214	1.13775E-01	.8501409	.6938753	1.18577	2339.3147	1710.5250	2123.7665	34.0106
18	.63342	2.0700E-03	.819944	.909007	1.20234E-01	.8306485	.6586926	1.16244	2280.2656	1689.6933	2086.9648	33.0369
19	.65919	2.2293E-03	.798974	.897781	1.25785E-01	.8113561	.6251817	1.13928	2221.9463	1668.8243	2050.5409	32.1038
20	.68433	2.3886E-03	.778287	.886541	1.30532E-01	.7922701	.5932938	1.11630	2164.4158	1647.9326	2014.5065	31.2159
21	.70891	2.5478E-03	.757896	.875295	1.34568E-01	.7733925	.5629655	1.09352	2107.7074	1627.0266	1978.8655	30.3715
22	.73298	2.7071E-03	.737806	.864043	1.37969E-01	.7547231	.5341266	1.07096	2051.8392	1606.1118	1943.6177	29.5685
23	.75662	2.8664E-03	.718022	.852789	1.40803E-01	.7362610	.5067046	1.04861	1996.8194	1585.1921	1908.7613	28.8049
24	.77986	3.0257E-03	.698544	.841534	1.43125E-01	.7180048	.4806272	1.02648	1942.6499	1564.2708	1874.2935	28.0788
25	.80275	3.1850E-03	.679370	.830279	1.44987E-01	.6999530	.4558243	1.00458	1889.3287	1543.3510	1840.2117	27.3882
26	.82532	3.3443E-03	.660500	.819028	1.46432E-01	.6821042	.4322280	.98289	1836.8511	1522.4357	1806.5132	26.7311
27	.84761	3.5035E-03	.641931	.807780	1.47497E-01	.6644573	.4097740	.96142	1785.2108	1501.5284	1773.1958	26.1059
28	.86965	3.6628E-03	.623661	.796539	1.48217E-01	.6470113	.3884009	.94016	1734.4005	1480.6330	1740.2578	25.5108
29	.89146	3.8221E-03	.605686	.785306	1.48621E-01	.6297654	.3680508	.91911	1684.4119	1459.7534	1707.6974	24.9442
30	.91307	3.9814E-03	.588003	.774084	1.48737E-01	.6127189	.3486692	.89827	1635.2364	1438.8940	1675.5137	24.4045
31	.93451	4.1407E-03	.570610	.762876	1.48586E-01	.5958714	.3302048	.87763	1586.8652	1418.0596	1643.7056	23.8904
32	.95579	4.2999E-03	.553502	.751684	1.48193E-01	.5792224	.3126090	.85718	1539.2891	1397.2549	1612.2723	23.4004
33	.97693	4.4592E-03	.536677	.740510	1.47574E-01	.5627717	.2958367	.83693	1492.4948	1376.4851	1581.2133	22.9354
34	.99795	4.6185E-03	.520131	.729358	1.46749E-01	.5465189	.2798451	.81687	1446.4852	1355.7552	1550.5281	22.4881
35	1.01888	4.7778E-03	.503861	.718230	1.45732E-01	.5304639	.2645941	.79700	1401.2386	1335.0707	1520.2161	22.0655
36	1.03972	4.9371E-03	.487864	.707130	1.44539E-01	.5146063	.2500462	.77730	1356.7497	1314.4368	1490.2770	21.6584
37	1.06050	5.0964E-03	.472136	.696060	1.43183E-01	.4989459	.2361660	.75778	1313.0089	1293.8589	1460.7101	21.2719
38	1.08123	5.2556E-03	.456673	.685022	1.41675E-01	.4834823	.2229204	.73843	1270.0065	1273.3422	1431.5149	20.9031
39	1.10192	5.4149E-03	.441472	.674021	1.40028E-01	.4682152	.2102780	.71924	1227.7327	1252.8918	1402.6905	20.5511
40	1.12260	5.5742E-03	.426529	.663057	1.38251E-01	.4531440	.1982097	.70021	1186.1776	1232.5129	1374.2562	20.2150
41	1.14327	5.7335E-03	.411842	.652135	1.36353E-01	.4382682	.1866079	.68134	1145.3315	1212.2104	1346.1507	19.8942
42	1.16395	5.8928E-03	.397405	.641257	1.34344E-01	.4235871	.1756867	.66262	1105.1835	1191.9889	1318.4328	19.5879
43	1.18466	6.0520E-03	.383216	.630424	1.32232E-01	.4090999	.1651818	.64404	1065.7240	1171.8531	1291.0809	19.2954
44	1.20541	6.2113E-03	.369271	.619640	1.30023E-01	.3948056	.1551502	.62560	1026.9423	1151.8070	1264.0931	19.0161
45	1.22622	6.3706E-03	.355565	.608906	1.27726E-01	.3807030	.1455704	.60730	988.8275	1131.8547	1237.4675	18.7493
46	1.24711	6.5299E-03	.342096	.598225	1.25345E-01	.3667909	.1364221	.58912	951.3667	1111.9999	1211.2015	18.4946
47	1.26809	6.6892E-03	.328858	.587597	1.22886E-01	.3530679	.1276662	.57106	914.5548	1092.2458	1185.2924	18.2514
48	1.28918	6.8485E-03	.315848	.577026	1.20356E-01	.3395325	.1193448	.55312	878.3741	1072.5954	1159.7372	18.0191
49	1.31040	7.0077E-03	.303062	.566512	1.17759E-01	.3261822	.1113810	.53528	842.8150	1053.0512	1134.5323	17.7973
50	1.33177	7.1670E-03	.290494	.556056	1.15099E-01	.3130157	.1037789	.51755	807.8651	1033.6153	1109.6738	17.5857

BEST AVAILABLE COPY

PROFILES-- STA (42) X= 4.36646 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT *
				** DIMENSIONLESS **				**		** DIMENSIONAL **		
51	1.35332	7.3263E-03	.278142	.545659	1.12380E-01	.3000303	.0965235	.49991	773.5120	1014.2894	1085.1575	17.3836
52	1.37506	7.4856E-03	.265999	.535322	1.09605E-01	.2872236	.0896008	.48235	739.7424	995.0744	1060.9784	17.1909
53	1.39702	7.6449E-03	.254061	.525045	1.06779E-01	.2745927	.0829976	.46487	706.5430	975.9710	1037.1312	17.0070
54	1.41924	7.8041E-03	.242323	.514828	1.03902E-01	.2621345	.0767014	.44747	673.8995	956.9789	1013.6100	16.8317
55	1.44173	7.9634E-03	.230779	.504670	1.00979E-01	.2498454	.0707005	.43012	641.7970	938.0973	990.4082	16.6646
56	1.46453	8.1227E-03	.219425	.494571	9.80095E-02	.2377216	.0649841	.41281	610.2199	919.3246	967.5185	16.5054
57	1.48769	8.2820E-03	.208253	.484529	9.49959E-02	.2257587	.0595420	.39555	579.1516	900.6581	944.9326	16.3539
58	1.51124	8.4413E-03	.197258	.474542	9.19387E-02	.2139519	.0543645	.37831	548.5741	882.0942	922.6414	16.2097
59	1.53524	8.6006E-03	.186432	.464608	8.88382E-02	.2022958	.0494428	.36108	518.4685	863.6280	900.6346	16.0727
60	1.55973	8.7598E-03	.175769	.454722	8.56937E-02	.1907841	.0447686	.34385	488.8139	845.2531	878.9004	15.9426
61	1.58479	8.9191E-03	.165260	.444882	8.25042E-02	.1794098	.0403343	.32660	459.5873	826.9616	857.4258	15.8191
62	1.61049	9.0784E-03	.154895	.435081	7.92676E-02	.1681650	.0361328	.30930	430.7636	808.7435	836.1956	15.7021
63	1.63691	9.2377E-03	.144665	.425315	7.59807E-02	.1570488	.0321575	.29191	402.3134	790.5900	815.2083	15.5914
64	1.66417	9.3970E-03	.134556	.415594	7.26389E-02	.1460073	.0284020	.27467	374.2013	772.5194	794.3618	15.4868
65	1.69239	9.5562E-03	.124554	.405923	6.92352E-02	.1351082	.0248586	.25726	346.3833	754.5427	773.7844	15.3882
66	1.72175	9.7155E-03	.114637	.396287	6.57602E-02	.1243325	.0215230	.23964	318.8065	736.6306	753.4398	15.2953
67	1.75246	9.8748E-03	.104785	.386665	6.22013E-02	.1136568	.0183919	.22175	291.4060	718.7459	733.2842	15.2081
68	1.78478	1.0034E-02	.094966	.377032	5.85408E-02	.1030520	.0154626	.20352	264.0997	700.8398	713.2622	15.1265
69	1.81909	1.0193E-02	.085142	.367352	5.47537E-02	.0924797	.0127334	.18486	236.7795	682.8467	693.3017	15.0506
70	1.85591	1.0353E-02	.075259	.357576	5.08038E-02	.0818874	.0102036	.16562	209.2940	664.6739	673.3034	14.9801
71	1.89601	1.0512E-02	.065234	.347628	4.66342E-02	.0711979	.0078736	.14560	181.4170	646.1832	653.1217	14.9152
72	1.94063	1.0671E-02	.054934	.337389	4.21480E-02	.0602871	.0057447	.12446	152.7715	627.1493	632.5220	14.8560
73	1.99206	1.0830E-02	.044089	.326630	3.71495E-02	.0489227	.0038172	.10152	122.6101	607.1501	611.0661	14.8023
74	2.05580	1.0990E-02	.031860	.314744	3.10297E-02	.0364774	.0020662	.07473	88.6025	585.0568	587.5694	14.7535
75	2.16581	1.1149E-02	.014065	.298678	1.93903E-02	.0197812	.0004239	.03387	39.1149	555.1935	556.0468	14.7078
76	3.72004	1.1308E-02	.000474	.280583	4.11727E-03	.0015307	.0000005	.00118	1.3188	521.5571	521.5899	14.6960
77	4.79444	1.1468E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (43)   X=   5.00000   PRESSURE=   14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT*
1	0.00000	0.	.999894	1.000002	2.92684E-02	.9984620	1.0003513	1.35607	2780.7049	1858.8365	2403.7970	42.5502
2	.04636	1.1468E-05	.999894	1.000002	2.92684E-02	.9984620	1.0003513	1.35607	2780.7049	1858.8365	2403.7970	42.5502
3	.06655	2.3631E-05	.999862	.999992	2.92707E-02	.9984348	1.0002745	1.35603	2780.6169	1858.8180	2403.7455	42.5481
4	.08275	3.6531E-05	.999817	.999974	2.92745E-02	.9983927	1.0001688	1.35598	2780.4907	1858.7855	2403.6661	42.5451
5	.09702	5.0214E-05	.999758	.999950	2.92803E-02	.9983362	1.0000330	1.35591	2780.3256	1858.7397	2403.5593	42.5414
6	.11015	6.4727E-05	.999681	.999917	2.92888E-02	.9982625	.9998607	1.35583	2780.1141	1858.6787	2403.4203	42.5366
7	.12255	8.0120E-05	.999585	.999874	2.93014E-02	.9981679	.9996430	1.35573	2779.8448	1858.5988	2403.2416	42.5305
8	.13446	9.6447E-05	.999462	.999818	2.93199E-02	.9980467	.9993678	1.35560	2779.5026	1858.4954	2403.0129	42.5228
9	.14603	1.1376E-04	.999305	.999746	2.93468E-02	.9978920	.9990197	1.35543	2779.0677	1858.3620	2402.7207	42.5131
10	.15738	1.3213E-04	.999106	.999654	2.93862E-02	.9976944	.9985783	1.35522	2778.5143	1858.1903	2402.3477	42.5008
11	.16859	1.5161E-04	.998853	.999535	2.94436E-02	.9974421	.9980175	1.35495	2777.8092	1857.9695	2401.8713	42.4852
12	.17971	1.7227E-04	.998529	.999383	2.95275E-02	.9971196	.9973037	1.35461	2776.9094	1857.6858	2401.2625	42.4654
13	.19081	1.9419E-04	.998115	.999186	2.96496E-02	.9967073	.9963933	1.35417	2775.7591	1857.3209	2400.4840	42.4400
14	.20192	2.1743E-04	.997586	.998934	2.98275E-02	.9961797	.9952306	1.35361	2774.2868	1856.8518	2399.4879	42.4076
15	.21307	2.4209E-04	.996908	.998609	3.00854E-02	.9955046	.9937445	1.35289	2772.4012	1856.2485	2398.2132	42.3663
16	.22429	2.6823E-04	.996040	.998192	3.04577E-02	.9946414	.9918455	1.35198	2769.9864	1855.4734	2396.5837	42.3134
17	.23562	2.9597E-04	.994929	.997658	3.09906E-02	.9935404	.9894231	1.35081	2766.8988	1854.4795	2394.5049	42.2459
18	.24708	3.2539E-04	.993515	.996975	3.17440E-02	.9921416	.9863448	1.34932	2762.9650	1853.2101	2391.8640	42.1602
19	.25869	3.5659E-04	.991724	.996108	3.27906E-02	.9903766	.9824589	1.34743	2757.9837	1851.5992	2388.5317	42.0520
20	.27047	3.8968E-04	.989477	.995019	3.42109E-02	.9881718	.9776022	1.34506	2751.7355	1849.5742	2384.3691	41.9168
21	.28244	4.2478E-04	.986696	.993668	3.60823E-02	.9854551	.9716160	1.34213	2744.0003	1847.0624	2379.2399	41.7501
22	.29462	4.6201E-04	.983310	.992019	3.84643E-02	.9821649	.9643664	1.33855	2734.5838	1843.9985	2373.0279	41.5482
23	.30705	5.0149E-04	.979268	.990048	4.13830E-02	.9782590	.9557657	1.33428	2723.3432	1840.3336	2365.6536	41.3068
24	.31972	5.4337E-04	.974543	.987738	4.48243E-02	.9737199	.9457847	1.32929	2710.2045	1836.0406	2357.0858	41.0308
25	.33267	5.8779E-04	.969134	.985088	4.87373E-02	.9685535	.9344512	1.32356	2695.1618	1831.1141	2347.3295	40.7153
26	.34592	6.3491E-04	.963057	.982103	5.30467E-02	.9627623	.9218358	1.31712	2678.2604	1825.5650	2336.4336	40.3640
27	.35948	6.8488E-04	.956337	.978793	5.76677E-02	.9564370	.9080316	1.30998	2659.5735	1819.4131	2324.4537	39.9796
28	.37338	7.3788E-04	.949004	.975171	6.25180E-02	.9495489	.8931378	1.30218	2639.1804	1812.6794	2311.4488	39.5649
29	.38764	7.9410E-04	.941083	.971245	6.75241E-02	.9421445	.8772481	1.29374	2617.1521	1805.3822	2297.4693	39.1225
30	.40227	8.5372E-04	.932594	.967023	7.26237E-02	.9342443	.8604459	1.28467	2593.5452	1797.5339	2282.5538	38.6546
31	.41731	9.1696E-04	.923553	.962508	7.77651E-02	.9258617	.8428032	1.27498	2568.3995	1789.1410	2266.7275	38.1634
32	.43276	9.8404E-04	.913966	.957700	8.29058E-02	.9170040	.8243817	1.26469	2541.7392	1780.2037	2250.0042	37.6504
33	.44866	1.0552E-03	.903839	.952596	8.80105E-02	.9076729	.8052350	1.25378	2513.5749	1770.7168	2232.3870	37.1173
34	.46502	1.1306E-03	.893170	.947191	9.30493E-02	.8978652	.7854099	1.24227	2483.9058	1760.6698	2213.8702	36.5653
35	.48188	1.2107E-03	.881957	.941477	9.79965E-02	.8875743	.7649490	1.23013	2452.7216	1750.0481	2194.4409	35.9956
36	.49925	1.2956E-03	.870192	.935443	1.02829E-01	.8767899	.7438917	1.21735	2420.0046	1738.8326	2174.0800	35.4092
37	.51716	1.3856E-03	.857868	.929078	1.07527E-01	.8654993	.7222755	1.20392	2385.7309	1727.0007	2152.7633	34.8074
38	.53564	1.4811E-03	.844974	.922367	1.12070E-01	.8536874	.7001371	1.18983	2349.8716	1714.5263	2130.4623	34.1909
39	.55473	1.5824E-03	.831497	.915294	1.16440E-01	.8413369	.6775133	1.17505	2312.3941	1701.3799	2107.1446	33.5610
40	.57444	1.6898E-03	.817426	.907843	1.20619E-01	.8284293	.6544414	1.15957	2273.2628	1687.5267	2082.7750	32.9186
41	.59482	1.8038E-03	.802747	.899993	1.24590E-01	.8149442	.6309601	1.14335	2232.4400	1672.9368	2057.3152	32.2647
42	.61590	1.9246E-03	.787446	.891723	1.28335E-01	.8008605	.6071094	1.12638	2189.8866	1657.5652	2030.7250	31.6006
43	.63772	2.0528E-03	.771508	.883012	1.31836E-01	.7861557	.5829313	1.10863	2145.5628	1641.3719	2002.9624	30.9274
44	.66031	2.1888E-03	.754919	.873834	1.35074E-01	.7708068	.5584700	1.09007	2099.4289	1624.3118	1973.9838	30.2463
45	.68373	2.3330E-03	.737665	.864164	1.38032E-01	.7547904	.5337719	1.07068	2051.4459	1606.3367	1943.7447	29.5586
46	.70801	2.4859E-03	.719733	.853974	1.40690E-01	.7380825	.5088857	1.05043	2001.5765	1587.3959	1912.2002	28.8656
47	.73321	2.6482E-03	.701110	.843236	1.43029E-01	.7206594	.4838628	1.02929	1949.7858	1567.4355	1879.3054	28.1689
48	.75938	2.8202E-03	.681784	.831919	1.45028E-01	.7024975	.4587568	1.00722	1896.0420	1546.3992	1845.0157	27.4698
49	.78659	3.0027E-03	.661747	.819992	1.46666E-01	.6835700	.4336237	.98421	1840.3175	1524.2285	1809.2882	26.7700
50	.81489	3.1963E-03	.640989	.807422	1.47923E-01	.6638670	.4085219	.96020	1782.5901	1500.8624	1772.0814	26.0711

PROFILES-- STA (43) X= 5.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
51	.84436	3.4016E-03	.619505	.794175	1.48776E-01	.6433562	.3835118	.93519	1722.8437	1476.2386	1733.3570	25.3747
52	.87507	3.6193E-03	.597292	.780217	1.49204E-01	.6220231	.3586557	.90912	1661.0698	1450.2932	1693.0800	24.6826
53	.90712	3.8503E-03	.574350	.765514	1.49183E-01	.5998516	.3340178	.88196	1597.2686	1422.9621	1651.2202	23.9965
54	.94060	4.0953E-03	.550683	.750030	1.48692E-01	.5768288	.3096636	.85369	1531.4504	1394.1808	1607.7532	23.3184
55	.97562	4.3551E-03	.526299	.733732	1.47707E-01	.5529453	.2856596	.82426	1463.6367	1363.8861	1562.6611	22.6500
56	1.01230	4.6307E-03	.501209	.716587	1.46207E-01	.5281960	.2620735	.79364	1393.8615	1332.0163	1515.9344	21.9933
57	1.05079	4.9230E-03	.475431	.698563	1.44168E-01	.5025806	.2389732	.76179	1322.1724	1298.5127	1467.5726	21.3501
58	1.09124	5.2330E-03	.448987	.679631	1.41570E-01	.4761045	.2164272	.72867	1248.6317	1263.3202	1417.5856	20.7223
59	1.13386	5.5618E-03	.421905	.659763	1.38392E-01	.4487787	.1945037	.69423	1173.3167	1226.3888	1365.9945	20.1118
60	1.17886	5.9106E-03	.394218	.638935	1.34615E-01	.4206208	.1732709	.65842	1096.3199	1187.6741	1312.8323	19.5206
61	1.22652	6.2805E-03	.365965	.617128	1.30220E-01	.3916545	.1527966	.62117	1017.7480	1147.1377	1258.1439	18.9505
62	1.27716	6.6728E-03	.337188	.594323	1.25189E-01	.3619095	.1331481	.58244	937.7194	1104.7474	1201.9854	18.4034
63	1.33121	7.0890E-03	.307933	.570506	1.19507E-01	.3314201	.1143929	.54211	856.3604	1060.4753	1144.4215	17.8812
64	1.38919	7.5304E-03	.278244	.545662	1.13157E-01	.3002229	.0965986	.50009	773.7970	1014.2945	1085.5209	17.3857
65	1.45181	7.9985E-03	.248164	.519774	1.06122E-01	.2683522	.0798345	.45622	690.1430	966.1725	1025.3491	16.9189
66	1.52004	8.4950E-03	.217720	.492814	9.83801E-02	.2358336	.0641731	.41029	605.4783	916.0590	963.9540	16.4829
67	1.59528	9.0217E-03	.186916	.464734	8.98980E-02	.2026708	.0496940	.36197	519.8132	863.8636	901.3426	16.0797
68	1.67972	9.5803E-03	.155708	.435443	8.06150E-02	.1688235	.0364913	.31080	433.0246	809.4151	837.4389	15.7121
69	1.77710	1.0173E-02	.123939	.404901	7.03882E-02	.1342151	.0246728	.25631	344.6731	752.6440	772.0982	15.3830
70	1.89512	1.0801E-02	.091108	.372974	5.87585E-02	.0968375	.0143764	.19632	253.3713	693.2956	705.3053	15.0963
71	2.05857	1.1468E-02	.053877	.336929	4.20446E-02	.0597863	.0055325	.12214	149.8318	626.2947	631.5766	14.8500
72	2.63971	1.2175E-02	.008330	.291239	1.28799E-02	.0121980	.0001524	.02031	23.1646	541.3649	541.7299	14.7002
73	26.92671	1.2924E-02	.000027	.279115	7.10650E-04	.0000681	.0000000	.00007	.0762	518.8276	518.8286	14.6960
74	38.55742	1.3720E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (45) X= 6.20000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT *
				** DIMENSIONLESS	**			**		** DIMENSIONAL	**	
1	0.00000	0.	.989994	.995356	3.11818E-02	.9886066	.9786002	1.34555	2753.1733	1850.2015	2385.1899	41.9446
2	.04648	1.1468E-05	.989994	.995356	3.11818E-02	.9886066	.9786002	1.34555	2753.1733	1850.2015	2385.1899	41.9446
3	.06674	2.3631E-05	.988286	.994517	3.22897E-02	.9869199	.9749309	1.34375	2748.4230	1848.6420	2382.0054	41.8424
4	.08299	3.6531E-05	.986047	.993430	3.37921E-02	.9847282	.9701192	1.34139	2742.1962	1846.6200	2377.8674	41.7084
5	.09733	5.0214E-05	.983420	.992157	3.56096E-02	.9821709	.9644894	1.33862	2734.8901	1844.2536	2373.0393	41.5517
6	.11054	6.4727E-05	.980450	.990718	3.77100E-02	.9792941	.9581517	1.33547	2726.6310	1841.5787	2367.6078	41.3752
7	.12303	8.0120E-05	.977163	.989123	4.00644E-02	.9761245	.9511718	1.33199	2717.4898	1838.6154	2361.6236	41.1808
8	.13505	9.6447E-05	.973579	.987383	4.26405E-02	.9726842	.9436046	1.32820	2707.5239	1835.3801	2355.1283	40.9701
9	.14674	1.1376E-04	.969718	.985504	4.54042E-02	.9689936	.9355013	1.32410	2696.7869	1831.8885	2348.1605	40.7445
10	.15822	1.3213E-04	.965598	.983496	4.83215E-02	.9650714	.9269099	1.31973	2685.3284	1828.1554	2340.7554	40.5053
11	.16958	1.5161E-04	.961234	.981365	5.13611E-02	.9609340	.9178739	1.31509	2673.1928	1824.1937	2332.9440	40.2537
12	.18087	1.7227E-04	.956640	.979116	5.44952E-02	.9565950	.9084309	1.31020	2660.4169	1820.0142	2324.7520	39.9907
13	.19216	1.9419E-04	.951827	.976755	5.77001E-02	.9520651	.8986124	1.30507	2647.0300	1815.6252	2316.1994	39.7174
14	.20347	2.1743E-04	.946801	.974284	6.09559E-02	.9473518	.8884441	1.29971	2633.0535	1811.0322	2307.3008	39.4342
15	.21485	2.4209E-04	.941568	.971706	6.42465E-02	.9424603	.8779460	1.29412	2618.5018	1806.2386	2298.0657	39.1419
16	.22633	2.6823E-04	.936132	.969019	6.75586E-02	.9373933	.8671337	1.28830	2603.3824	1801.2455	2288.4991	38.8408
17	.23794	2.9597E-04	.930492	.966225	7.08814E-02	.9321514	.8560188	1.28226	2587.6975	1796.0519	2278.6023	38.5314
18	.24970	3.2539E-04	.924647	.963322	7.42058E-02	.9267335	.8446100	1.27599	2571.4446	1790.6554	2268.3734	38.2137
19	.26163	3.5659E-04	.918597	.960308	7.75244E-02	.9211371	.8329132	1.26949	2554.6169	1785.0517	2257.8075	37.8880
20	.27377	3.8968E-04	.912335	.957179	8.08307E-02	.9153585	.8209328	1.26275	2537.2045	1779.2355	2246.8975	37.5544
21	.28611	4.2478E-04	.905859	.953932	8.41191E-02	.9093928	.8086714	1.25577	2519.1944	1773.2001	2235.6342	37.2130
22	.29870	4.6201E-04	.899163	.950563	8.73845E-02	.9032343	.7961308	1.24854	2500.5712	1766.9378	2224.0069	36.8638
23	.31155	5.0149E-04	.892239	.947067	9.06223E-02	.8968763	.7833120	1.24105	2481.3172	1760.4400	2212.0030	36.5069
24	.32467	5.4337E-04	.885082	.943440	9.38279E-02	.8903116	.7702156	1.23329	2461.4132	1753.6969	2199.6088	36.1422
25	.33809	5.8779E-04	.877684	.939674	9.69970E-02	.8835321	.7568420	1.22526	2440.8379	1746.6979	2186.8092	35.7698
26	.35182	6.3491E-04	.870035	.935765	1.00125E-01	.8765293	.7431914	1.21694	2419.5687	1739.4316	2173.5879	35.3897
27	.36589	6.8488E-04	.862129	.931706	1.03208E-01	.8692940	.7292644	1.20832	2397.5817	1731.8856	2159.9275	35.0020
28	.38031	7.3786E-04	.853956	.927488	1.06241E-01	.8618163	.7150615	1.19939	2374.8516	1724.0465	2145.8048	34.6065
29	.39511	7.9410E-04	.845506	.923106	1.09219E-01	.8540861	.7005840	1.19014	2351.3520	1715.9001	2131.2150	34.2034
30	.41030	8.5372E-04	.836769	.918550	1.12138E-01	.8460924	.6858335	1.18055	2327.0553	1707.4312	2116.1229	33.7926
31	.42590	9.1696E-04	.827736	.913812	1.14992E-01	.8378238	.6708121	1.17062	2301.9332	1698.6237	2100.5119	33.3744
32	.44194	9.8404E-04	.818395	.908882	1.17775E-01	.8292686	.6555228	1.16032	2275.9562	1689.4603	2084.3596	32.9487
33	.45844	1.0552E-03	.808736	.903751	1.20482E-01	.8204142	.6399693	1.14965	2249.0938	1679.9228	2067.6426	32.5156
34	.47541	1.1306E-03	.798747	.898409	1.23106E-01	.8112478	.6241563	1.13858	2221.3150	1669.9917	2050.3364	32.0753
35	.49290	1.2107E-03	.788417	.892843	1.25642E-01	.8017560	.6080693	1.12711	2192.5879	1659.6466	2032.4159	31.6279
36	.51091	1.2956E-03	.777735	.887043	1.28081E-01	.7919248	.5917751	1.11521	2162.8799	1648.8657	2013.8546	31.1736
37	.52948	1.3856E-03	.766688	.880997	1.30417E-01	.7817399	.5752214	1.10287	2132.1581	1637.6259	1994.6255	30.7127
38	.54863	1.4811E-03	.755264	.874690	1.32642E-01	.7711865	.5584373	1.09007	2100.3888	1625.9030	1974.7005	30.2454
39	.56839	1.5824E-03	.743451	.868110	1.34747E-01	.7602492	.5414330	1.07680	2067.5383	1613.6712	1954.0509	29.7719
40	.58879	1.6898E-03	.731238	.861241	1.36724E-01	.7489123	.5242201	1.06303	2033.5725	1600.9035	1932.6470	29.2926
41	.60987	1.8038E-03	.718611	.854069	1.38563E-01	.7371599	.5068119	1.04874	1998.4573	1587.5715	1910.4584	28.8079
42	.63166	1.9246E-03	.705559	.846577	1.40255E-01	.7249755	.4892227	1.03392	1962.1590	1573.6450	1887.4542	28.3181
43	.65419	2.0528E-03	.692069	.838748	1.41790E-01	.7123424	.4714687	1.01854	1924.6440	1559.0926	1863.6030	27.8238
44	.67750	2.1888E-03	.678130	.830565	1.43157E-01	.6992439	.4535675	1.00258	1885.8793	1543.8814	1838.6728	27.3255
45	.70163	2.3330E-03	.663730	.822009	1.44344E-01	.6856628	.4355384	.98603	1845.8331	1527.9769	1813.2317	26.8233
46	.72664	2.4859E-03	.648858	.813060	1.45341E-01	.6715822	.4174022	.96885	1804.4746	1511.3430	1786.6475	26.3183
47	.75255	2.6482E-03	.633504	.803699	1.46134E-01	.6569851	.3991817	.95103	1761.7744	1493.9425	1759.0882	25.8110
48	.77943	2.8202E-03	.617657	.793905	1.46712E-01	.6418548	.3809010	.93254	1717.7053	1475.7365	1730.5223	25.3020
49	.80733	3.0027E-03	.601310	.783656	1.47061E-01	.6261751	.3625861	.91336	1672.2423	1456.6849	1700.9189	24.7920
50	.83630	3.1963E-03	.584453	.772929	1.47167E-01	.6099300	.3442647	.89346	1625.3632	1436.7468	1670.2482	24.2819

PROFILES-- STA (45) X= 6.20000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
51	.86642	3.4016E-03	.567080	.761705	1.47017E-01	.5931046	.3259658	.87282	1577.0492	1415.8798	1658.4818	23.7723
52	.89775	3.6193E-03	.549186	.749955	1.46596E-01	.5756847	.3077206	.85141	1527.2854	1394.0411	1605.5930	23.2643
53	.93037	3.8503E-03	.530766	.737660	1.45890E-01	.5576575	.2895613	.82920	1476.0611	1371.1874	1571.5578	22.7587
54	.96437	4.0953E-03	.511820	.724796	1.44883E-01	.5390117	.2715220	.80617	1423.3709	1347.2753	1536.3545	22.2564
55	.99983	4.3551E-03	.492346	.711339	1.43562E-01	.5197377	.2536381	.78228	1369.2151	1322.2614	1499.9651	21.7584
56	1.03686	4.6307E-03	.472348	.697267	1.41909E-01	.4998281	.2359464	.75751	1313.6001	1296.1032	1462.3757	21.2658
57	1.07559	4.9230E-03	.451830	.682557	1.39911E-01	.4792778	.2184849	.73182	1256.5395	1268.7593	1423.5768	20.7796
58	1.11614	5.2330E-03	.430800	.667187	1.37553E-01	.4580847	.2012930	.70519	1198.0543	1240.1901	1383.5642	20.3009
59	1.15867	5.5618E-03	.409268	.651139	1.34818E-01	.4362498	.1844112	.67757	1138.1735	1210.3582	1342.3399	19.8308
60	1.20335	5.9106E-03	.387247	.634392	1.31693E-01	.4137775	.1678809	.64892	1076.9342	1179.2292	1299.9122	19.3705
61	1.25038	6.2805E-03	.364754	.616931	1.28164E-01	.3906760	.1517450	.61921	1014.3821	1146.7721	1256.2966	18.9213
62	1.30001	6.6728E-03	.341809	.598741	1.24215E-01	.3669573	.1360471	.58839	950.5708	1112.9599	1211.5157	18.4842
63	1.35253	7.0890E-03	.318433	.579810	1.19834E-01	.3426374	.1208320	.55640	885.5609	1077.7698	1165.5996	18.0605
64	1.40829	7.5304E-03	.294649	.560127	1.15006E-01	.3177357	.1061461	.52317	819.4184	1041.1828	1118.5853	17.6516
65	1.46772	7.9985E-03	.270482	.539684	1.09718E-01	.2922749	.0920370	.48864	752.2114	1003.1832	1070.5151	17.2587
66	1.53138	8.4950E-03	.245956	.518474	1.03952E-01	.2662787	.0785548	.45269	684.0048	963.7563	1021.4343	16.8833
67	1.59999	9.0217E-03	.221090	.496486	9.76904E-02	.2397700	.0657520	.41520	614.8511	922.8843	971.3860	16.5268
68	1.67454	9.5803E-03	.195892	.473705	9.09073E-02	.2127659	.0536856	.37600	544.7752	880.5380	920.4022	16.1908
69	1.75642	1.0173E-02	.170351	.450101	8.35642E-02	.1852690	.0424183	.33484	473.7461	836.6624	868.4880	15.8771
70	1.84774	1.0801E-02	.144414	.425614	7.55955E-02	.1572582	.0320206	.29130	401.6149	791.1449	815.6037	15.5876
71	1.95196	1.1468E-02	.117926	.400202	6.68719E-02	.1285990	.0225684	.24531	327.9533	743.9088	761.4950	15.3244
72	2.07570	1.2175E-02	.090463	.373630	5.70886E-02	.0992462	.0141466	.19476	251.5787	694.5161	706.0769	15.0899
73	2.23581	1.2924E-02	.060510	.344612	4.51355E-02	.0678845	.0068290	.13564	168.2783	640.5755	646.8660	14.8861
74	2.55829	1.3720E-02	.020328	.305962	2.14145E-02	.0271099	.0008646	.04836	56.5317	568.7320	569.8835	14.7201
75	7.44704	1.4563E-02	.000464	.280104	3.13943E-03	.0010517	.0000005	.00115	1.2901	520.6665	520.6857	14.6960
76	10.36042	1.5458E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (49) X= 7.50000 PRESSURE= 14.6960

	*			** DIMENSIONLESS	**			**	** DIMENSIONAL	**	*
N	Y	PSI	UD	THO	TI	TTO	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	.871941	.937906	8.27880E-02	.8767141	.7453508	1.21831	2424.8672	1743.4111	2173.9369	35.4499
2	.04808	1.1468E-05	.871941	.937906	8.27880E-02	.8767141	.7453508	1.21831	2424.8672	1743.4111	2173.9369	35.4499
3	.06903	2.3631E-05	.869680	.936668	8.42498E-02	.8746247	.7414277	1.21589	2418.5814	1741.1101	2169.9921	35.3406
4	.08586	3.6531E-05	.866911	.935191	8.59745E-02	.8721004	.7365974	1.21291	2410.8802	1738.3647	2165.2261	35.2061
5	.10070	5.0214E-05	.863876	.933590	8.77908E-02	.8693495	.7313080	1.20963	2402.4403	1735.3890	2160.0324	35.0589
6	.11438	6.4727E-05	.860655	.931900	8.96427E-02	.8664366	.7257100	1.20613	2393.4804	1732.2461	2154.5328	34.9030
7	.12731	8.0120E-05	.857279	.930133	9.15060E-02	.8633884	.7198695	1.20246	2384.0932	1728.9615	2148.7779	34.7404
8	.13976	9.6447E-05	.853766	.928295	9.33687E-02	.8602174	.7138197	1.19864	2374.3222	1725.5460	2142.7909	34.5719
9	.15187	1.1376E-04	.850121	.926390	9.52246E-02	.8569288	.7075782	1.19466	2364.1878	1722.0040	2136.5821	34.3981
10	.16377	1.3213E-04	.846350	.924416	9.70701E-02	.8535244	.7011548	1.19054	2353.6980	1718.3360	2130.1546	34.2193
11	.17553	1.5161E-04	.842450	.922374	9.89031E-02	.8500038	.6945545	1.18627	2342.8536	1714.5403	2123.5078	34.0355
12	.18724	1.7227E-04	.838422	.920262	1.00722E-01	.8463653	.6877794	1.18186	2331.6506	1710.6139	2116.6382	33.8468
13	.19893	1.9419E-04	.834262	.918077	1.02527E-01	.8426060	.6808299	1.17730	2320.0823	1706.5528	2109.5408	33.6533
14	.21065	2.1743E-04	.829968	.915818	1.04317E-01	.8387227	.6737054	1.17258	2308.1397	1702.3523	2102.2090	33.4549
15	.22243	2.4209E-04	.825535	.913480	1.06092E-01	.8347113	.6664044	1.16770	2295.8121	1698.0070	2094.6355	33.2517
16	.23432	2.6823E-04	.820959	.911061	1.07850E-01	.8305676	.6589251	1.16266	2283.0876	1693.5111	2086.8122	33.0434
17	.24634	2.9597E-04	.816236	.908558	1.09592E-01	.8262869	.6512651	1.15745	2269.9534	1688.8583	2078.7303	32.8301
18	.25852	3.2539E-04	.811361	.905967	1.11316E-01	.8218643	.6434222	1.15207	2256.3957	1684.0420	2070.3803	32.6117
19	.27087	3.5659E-04	.806329	.903284	1.13022E-01	.8172944	.6353939	1.14650	2242.4000	1679.0550	2061.7523	32.3882
20	.28342	3.8968E-04	.801133	.900506	1.14709E-01	.8125717	.6271777	1.14075	2227.9511	1673.8898	2052.8358	32.1594
21	.29620	4.2478E-04	.795769	.897627	1.16377E-01	.8076904	.6187713	1.13480	2213.0331	1668.5386	2043.6200	31.9253
22	.30923	4.6201E-04	.790230	.894643	1.18022E-01	.8026445	.6101725	1.12864	2197.6295	1662.9930	2034.0934	31.6859
23	.32251	5.0149E-04	.784510	.891551	1.19645E-01	.7974277	.6013790	1.12228	2181.7234	1657.2444	2024.2440	31.4411
24	.33608	5.4337E-04	.778604	.888344	1.21243E-01	.7920334	.5923889	1.11570	2165.2969	1651.2834	2014.0596	31.1907
25	.34996	5.8779E-04	.772503	.885018	1.22815E-01	.7864549	.5832006	1.10889	2148.3321	1645.1005	2003.5273	30.9349
26	.36415	6.3491E-04	.766203	.881567	1.24359E-01	.7806849	.5738125	1.10184	2130.8099	1638.6856	1992.6335	30.6735
27	.37869	6.8488E-04	.759695	.877985	1.25872E-01	.7747161	.5642235	1.09455	2112.7113	1632.0280	1981.3646	30.4065
28	.39359	7.3788E-04	.752972	.874267	1.27352E-01	.7685410	.5544327	1.08701	2094.0162	1625.1165	1969.7060	30.1339
29	.40887	7.9410E-04	.746028	.870406	1.28796E-01	.7621516	.5444396	1.07920	2074.7043	1617.9395	1957.6428	29.8556
30	.42455	8.5372E-04	.738855	.866395	1.30202E-01	.7555397	.5342442	1.07112	2054.7546	1610.4845	1945.1595	29.5717
31	.44066	9.1696E-04	.731444	.862228	1.31565E-01	.7486968	.5238466	1.06276	2034.1457	1602.7388	1932.2401	29.2822
32	.45721	9.8404E-04	.723788	.857898	1.32883E-01	.7416141	.5132476	1.05410	2012.8557	1594.6866	1918.8679	28.9871
33	.47422	1.0552E-03	.715880	.853395	1.34152E-01	.7342825	.5024485	1.04514	1990.8619	1586.3198	1905.0259	28.6864
34	.49173	1.1306E-03	.707710	.848714	1.35368E-01	.7266927	.4914511	1.03586	1968.1417	1577.6174	1890.6963	28.3802
35	.50975	1.2107E-03	.699271	.843844	1.36527E-01	.7188349	.4802576	1.02624	1944.6715	1568.5656	1875.8607	28.0685
36	.52830	1.2956E-03	.690553	.838778	1.37624E-01	.7106991	.4688711	1.01629	1920.4278	1559.1480	1860.5004	27.7515
37	.54742	1.3856E-03	.681548	.833505	1.38654E-01	.7022751	.4572951	1.00598	1895.3863	1549.3473	1844.5959	27.4291
38	.56713	1.4811E-03	.672248	.828017	1.39612E-01	.6935524	.4455338	.99531	1869.5227	1539.1454	1828.1273	27.1016
39	.58745	1.5824E-03	.662644	.822303	1.40493E-01	.6845199	.4335922	.98425	1842.8124	1528.5234	1811.0741	26.7691
40	.60843	1.6898E-03	.652726	.816351	1.41291E-01	.6751668	.4214762	.97280	1815.2306	1517.4613	1793.4153	26.4318
41	.63008	1.8038E-03	.642486	.810153	1.42000E-01	.6654815	.4091922	.96094	1786.7523	1505.9385	1775.1295	26.0897
42	.65245	1.9246E-03	.631914	.803694	1.42612E-01	.6554526	.3967476	.94865	1757.3529	1493.9332	1756.1949	25.7432
43	.67556	2.0528E-03	.621002	.796964	1.43122E-01	.6450683	.3841508	.93592	1727.0075	1481.4229	1736.5894	25.3925
44	.69945	2.1888E-03	.609742	.789949	1.43523E-01	.6343167	.3714109	.92273	1695.6917	1468.3841	1716.2904	25.0377
45	.72417	2.3330E-03	.598123	.782637	1.43806E-01	.6231858	.3585382	.90907	1663.3814	1454.7922	1695.2752	24.6793
46	.74975	2.4859E-03	.586139	.775014	1.43964E-01	.6116636	.3455438	.89492	1630.0532	1440.6219	1673.5212	24.3175
47	.77624	2.6482E-03	.573781	.767065	1.43988E-01	.5997379	.3324398	.88026	1595.6843	1425.8466	1651.0056	23.9526
48	.80368	2.8202E-03	.561040	.758777	1.43870E-01	.5873969	.3192397	.86507	1560.2529	1410.4398	1627.7057	23.5850
49	.83214	3.0027E-03	.547910	.750133	1.43601E-01	.5746286	.3059577	.84934	1523.7385	1394.3728	1603.5992	23.2152
50	.86165	3.1963E-03	.534384	.741119	1.43172E-01	.5514215	.2926092	.83304	1486.1217	1377.6172	1578.6642	22.8435

PROFILES-- STA (49)   X=   7.50000   PRESSURE=   14.6960

N	Y	* PSI	UD	THD	** DIMENSIONLESS ** TI	TTD **	PTD	MACH **	U	** DIMENSIONAL T	TOT **	* PTOT
51	.89228	3.4016E-03	.520455	.731719	1.42572E-01	.5477644	.2792110	.81615	1447.3853	1360.1435	1552.8795	22.4705
52	.92410	3.6193E-03	.506118	.721916	1.41793E-01	.5336465	.2657808	.79866	1407.5135	1341.9217	1526.2248	22.0965
53	.95717	3.8503E-03	.491368	.711694	1.40824E-01	.5190575	.2523375	.78054	1366.4932	1322.9214	1498.6809	21.7222
54	.99157	4.0953E-03	.476201	.701037	1.39654E-01	.5039881	.2389011	.76177	1324.3137	1303.1118	1470.2299	21.3481
55	1.02739	4.3551E-03	.460614	.689928	1.38273E-01	.4884298	.2254931	.74233	1280.9673	1282.4620	1440.8557	20.9747
56	1.06471	4.6307E-03	.444606	.678351	1.36669E-01	.4723748	.2121357	.72219	1236.4497	1260.9414	1410.5440	20.6028
57	1.10364	4.9230E-03	.428177	.666289	1.34832E-01	.4558171	.1988528	.70133	1190.7600	1238.5193	1379.2829	20.2329
58	1.14429	5.2330E-03	.411327	.653725	1.32751E-01	.4387516	.1856089	.67972	1143.9013	1215.1658	1347.0632	19.8658
59	1.18678	5.5618E-03	.394060	.640645	1.30414E-01	.4211750	.1726103	.65733	1095.8812	1190.8516	1313.8786	19.5022
60	1.23127	5.9106E-03	.376380	.627033	1.27809E-01	.4030656	.1597040	.63414	1046.7114	1165.5491	1279.7259	19.1429
61	1.27791	6.2805E-03	.358292	.612874	1.24926E-01	.3844838	.1469783	.61011	996.4087	1139.2309	1244.6057	18.7885
62	1.32690	6.6728E-03	.339804	.598156	1.21755E-01	.3653718	.1344630	.58520	944.9941	1111.8719	1208.5222	18.4400
63	1.37845	7.0890E-03	.320925	.582865	1.18278E-01	.3457538	.1221888	.55938	892.4935	1083.4483	1171.4834	18.0983
64	1.43282	7.5304E-03	.301667	.566989	1.14491E-01	.3256361	.1101879	.53261	838.9368	1053.9379	1133.5011	17.7641
65	1.49032	7.9985E-03	.282041	.550517	1.10378E-01	.3050265	.0984939	.50483	784.3568	1023.3199	1094.5903	17.4385
66	1.55132	8.4950E-03	.262060	.533439	1.05928E-01	.2839346	.0871422	.47599	728.7883	991.5741	1054.7686	17.1224
67	1.61627	9.0217E-03	.241735	.515743	1.01127E-01	.2623699	.0761699	.44601	672.2653	958.6794	1014.0545	16.8169
68	1.68575	9.5803E-03	.221078	.497415	9.59597E-02	.2403414	.0656167	.41482	614.8167	924.6120	972.4648	16.5231
69	1.76052	1.0173E-02	.200094	.478440	9.04070E-02	.2178549	.0555248	.38229	556.4603	889.3410	930.0102	16.2421
70	1.84156	1.0801E-02	.178781	.458794	8.44442E-02	.1949089	.0459404	.34830	497.1911	852.8213	886.6881	15.9752
71	1.93025	1.1468E-02	.157124	.438437	7.80363E-02	.1714881	.0369145	.31263	436.9615	814.9817	842.4696	15.7239
72	2.02864	1.2175E-02	.135072	.417340	7.11280E-02	.1475518	.0285021	.27514	375.6345	775.7654	797.2179	15.4896
73	2.13996	1.2924E-02	.112505	.395472	6.36193E-02	.1230823	.0207622	.23543	312.8773	735.1168	751.0795	15.2741
74	2.27000	1.3720E-02	.089149	.372650	5.52999E-02	.0979956	.0137712	.19218	247.9237	692.6950	703.7157	15.0795
75	2.43138	1.4563E-02	.064271	.348291	4.55640E-02	.0717072	.0076270	.14331	178.7384	647.4155	654.0832	14.9084
76	2.67520	1.5458E-02	.033813	.318960	2.95737E-02	.0405813	.0022968	.07879	94.0331	592.8927	595.3175	14.7600
77	4.05468	1.6407E-02	.002995	.284451	7.96190E-03	.0053896	.0000202	.00739	8.3290	528.7475	528.8757	14.6966
78	5.12710	1.7413E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (51) X= 9.00000 PRESSURE= 14.6960

N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
		*		** DIMENSIONLESS		**		**		** DIMENSIONAL	**	*
1	0.00000	0.	.705747	.850275	1.14898E-01	.7227545	.4869224	1.03210	1962.6816	1580.5192	1883.2610	28.2541
2	.06855	2.0814E-05	.705747	.850275	1.14898E-01	.7227545	.4869224	1.03210	1962.6816	1580.5192	1883.2610	28.2541
3	.09842	4.2890E-05	.703899	.849196	1.15535E-01	.7210902	.4844848	1.03001	1957.5444	1578.5146	1880.1187	28.1862
4	.12242	6.6304E-05	.701630	.847858	1.16292E-01	.7190307	.4815092	1.02744	1951.2335	1576.0265	1876.2305	28.1034
5	.14358	9.1139E-05	.699120	.846375	1.17100E-01	.7167491	.4782316	1.02460	1944.2537	1573.2706	1871.9228	28.0121
6	.16309	1.1748E-04	.696424	.844781	1.17939E-01	.7142950	.4747261	1.02154	1936.7561	1570.3064	1867.2895	27.9145
7	.18154	1.4542E-04	.693563	.843086	1.18799E-01	.7116868	.4710227	1.01829	1928.7983	1567.1556	1862.3651	27.8114
8	.19928	1.7505E-04	.690544	.841294	1.19674E-01	.7089314	.4671353	1.01486	1920.4033	1563.8260	1857.1630	27.7031
9	.21656	2.0648E-04	.687371	.839408	1.20559E-01	.7060310	.4630708	1.01126	1911.5794	1560.3194	1851.6870	27.5899
10	.23353	2.3982E-04	.684044	.837425	1.21453E-01	.7029846	.4588321	1.00747	1902.3256	1556.6342	1845.9354	27.4719
11	.25032	2.7517E-04	.680560	.835345	1.22352E-01	.6997900	.4544202	1.00350	1892.6372	1552.7670	1839.9040	27.3491
12	.26702	3.1267E-04	.676917	.833164	1.23253E-01	.6964439	.4498353	.99934	1882.5061	1548.7130	1833.5866	27.2214
13	.28370	3.5245E-04	.673111	.830879	1.24154E-01	.6929419	.4450759	.99499	1871.9212	1544.4661	1826.9748	27.0889
14	.30043	3.9464E-04	.669137	.828487	1.25052E-01	.6892795	.4401410	.99044	1860.8713	1540.0202	1820.0602	26.9515
15	.31727	4.3938E-04	.664992	.825985	1.25944E-01	.6854519	.4350294	.98569	1849.3441	1535.3681	1812.8335	26.8091
16	.33425	4.8684E-04	.660671	.823367	1.26829E-01	.6814533	.4297392	.98073	1837.3250	1530.5020	1805.2842	26.6618
17	.35143	5.3718E-04	.656166	.820630	1.27703E-01	.6772778	.4242066	.97555	1824.7990	1525.4135	1797.4010	26.5095
18	.36884	5.9057E-04	.651475	.817768	1.28563E-01	.6729197	.4186161	.97015	1811.7513	1520.0942	1789.1728	26.3521
19	.38651	6.4720E-04	.646590	.814777	1.29406E-01	.6683729	.4127808	.96452	1798.1670	1514.5355	1780.5884	26.1896
20	.40448	7.0726E-04	.641506	.811653	1.30230E-01	.6636306	.4067612	.95865	1784.0293	1508.7273	1771.6350	26.0220
21	.42278	7.7097E-04	.636217	.808388	1.31032E-01	.6586859	.4005559	.95253	1769.3202	1502.6592	1762.2993	25.8493
22	.44144	8.3854E-04	.630716	.804978	1.31807E-01	.6535315	.3941639	.94615	1754.0223	1496.3205	1752.5679	25.6713
23	.46049	9.1021E-04	.624998	.801417	1.32554E-01	.6481604	.3875847	.93950	1738.1181	1489.7004	1742.4272	25.4881
24	.47996	9.8622E-04	.619054	.797698	1.33266E-01	.6425654	.3808186	.93258	1721.5903	1482.7877	1731.8638	25.2997
25	.49988	1.0668E-03	.612881	.793816	1.33942E-01	.6367392	.3738660	.92538	1704.4219	1475.5710	1720.8639	25.1061
26	.52028	1.1524E-03	.606470	.789763	1.34576E-01	.6306735	.3667272	.91788	1686.5929	1468.0370	1709.4120	24.9073
27	.54119	1.2431E-03	.599814	.785532	1.35165E-01	.6243601	.3594027	.91008	1668.0833	1460.1722	1697.4923	24.7034
28	.56265	1.3392E-03	.592907	.781115	1.35706E-01	.6177904	.3518934	.90196	1648.8730	1451.9625	1685.0886	24.4943
29	.58467	1.4413E-03	.585740	.776505	1.36193E-01	.6109558	.3442012	.89351	1628.9423	1443.3934	1672.1849	24.2801
30	.60730	1.5495E-03	.578307	.771694	1.36623E-01	.6038477	.3363284	.88473	1608.2714	1434.4500	1658.7648	24.0609
31	.63057	1.6643E-03	.570601	.766673	1.36989E-01	.5964574	.3282779	.87559	1586.8407	1425.1169	1644.8119	23.8367
32	.65451	1.7860E-03	.562615	.761434	1.37287E-01	.5887761	.3200534	.86609	1564.6312	1415.3784	1630.3096	23.6077
33	.67916	1.9152E-03	.554342	.755968	1.37512E-01	.5807951	.3116594	.85622	1541.6239	1405.2181	1615.2415	23.3740
34	.70456	2.0521E-03	.545775	.750266	1.37656E-01	.5725058	.3031011	.84596	1517.8010	1394.6194	1599.5912	23.1357
35	.73075	2.1974E-03	.536910	.744319	1.37718E-01	.5638995	.2943848	.83530	1493.1455	1383.5654	1583.3426	22.8930
36	.75776	2.3514E-03	.527737	.738117	1.37687E-01	.5549667	.2855160	.82423	1467.6366	1372.0370	1566.4775	22.6460
37	.78564	2.5149E-03	.518251	.731649	1.37560E-01	.5456978	.2765011	.81273	1441.2551	1360.0144	1548.9777	22.3950
38	.81444	2.6882E-03	.508444	.724905	1.37330E-01	.5360831	.2673473	.80079	1413.9815	1347.4774	1530.8253	22.1401
39	.84421	2.8720E-03	.498309	.717873	1.36991E-01	.5261135	.2580629	.78840	1385.7978	1334.4055	1512.0026	21.8816
40	.87500	3.0670E-03	.487841	.710541	1.36535E-01	.5157796	.2486570	.77553	1356.6869	1320.7776	1492.4423	21.6197
41	.90687	3.2738E-03	.477034	.702899	1.35957E-01	.5050726	.2391396	.76217	1326.6329	1306.5723	1472.2774	21.3547
42	.93987	3.4932E-03	.465883	.694935	1.35248E-01	.4939837	.2295215	.74831	1295.6208	1291.7675	1451.3416	21.0869
43	.97407	3.7258E-03	.454382	.686636	1.34402E-01	.4825046	.2198146	.73392	1263.6373	1276.3411	1429.6690	20.8166
44	1.00955	3.9726E-03	.442528	.677990	1.33410E-01	.4706272	.2100316	.71900	1230.6702	1260.2704	1407.2445	20.5442
45	1.04637	4.2343E-03	.430316	.668986	1.32265E-01	.4583440	.2001862	.70351	1196.7093	1243.5326	1384.0538	20.2701
46	1.08462	4.5119E-03	.417744	.659610	1.30959E-01	.4456480	.1902931	.68746	1161.7458	1226.1045	1360.0837	19.9946
47	1.12439	4.8064E-03	.404809	.649850	1.29483E-01	.4325327	.1803678	.67080	1125.7735	1207.9631	1335.3220	19.7182
48	1.16579	5.1187E-03	.391509	.639694	1.27829E-01	.4189925	.1704269	.65353	1088.7879	1189.0853	1309.7581	19.4414
49	1.20890	5.4499E-03	.377845	.629130	1.25988E-01	.4050225	.1604881	.63562	1050.7871	1169.4481	1283.3827	19.1647
50	1.25387	5.8012E-03	.363816	.618145	1.23952E-01	.3906187	.1505699	.61705	1011.7720	1149.0288	1256.1883	18.8885

PROFILES-- STA (51) X= 9.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS TI	TTD **	PTD	MACH **	U	** DIMENSIONAL T	TOT **	PTOT *
51	1.30083	6.1739E-03	.349423	.606727	1.21712E-01	.3757780	.1406919	.59780	971.7460	1127.8052	1228.1692	18.6135
52	1.34992	6.5691E-03	.334669	.594865	1.19258E-01	.3604987	.1308748	.57784	930.7154	1105.7554	1199.3217	18.3401
53	1.40133	6.9883E-03	.319558	.582547	1.16582E-01	.3447798	.1211405	.55714	888.6895	1082.8583	1169.6444	18.0691
54	1.45524	7.4329E-03	.304092	.569763	1.13674E-01	.3286218	.1115117	.53568	845.6805	1059.0936	1139.1381	17.8010
55	1.51189	7.9045E-03	.288279	.556500	1.10524E-01	.3120263	.1020126	.51341	801.7032	1034.4414	1107.8058	17.5365
56	1.57155	8.4047E-03	.272123	.542751	1.07123E-01	.2949960	.0926685	.49031	756.7750	1008.8827	1075.6526	17.2763
57	1.63454	8.9352E-03	.255633	.528503	1.03460E-01	.2775346	.0835061	.46633	710.9149	982.3989	1042.6855	17.0212
58	1.70122	9.4979E-03	.238814	.513748	9.95226E-02	.2596465	.0745536	.44142	664.1425	954.9714	1008.9127	16.7719
59	1.77206	1.0095E-02	.221674	.498475	9.52969E-02	.2413361	.0658408	.41553	616.4765	926.5811	974.3427	16.5293
60	1.84764	1.0728E-02	.204219	.482671	9.07605E-02	.2226059	.0573997	.38858	567.9318	897.2058	938.9800	16.2943
61	1.92868	1.1399E-02	.186449	.466322	8.59155E-02	.2034595	.0492647	.36050	518.5151	866.8153	902.8316	16.0677
62	2.01614	1.2111E-02	.168363	.449406	8.07606E-02	.1838965	.0414729	.33117	468.2178	835.3717	865.8966	15.8508
63	2.11130	1.2866E-02	.149948	.431883	7.52404E-02	.1638677	.0340664	.30045	417.0041	802.7977	828.1202	15.6446
64	2.21598	1.3668E-02	.131169	.413755	6.93028E-02	.1434060	.0270868	.26835	364.7814	769.1019	789.4506	15.4502
65	2.33295	1.4517E-02	.111952	.395037	6.28849E-02	.1225161	.0205786	.23440	311.3381	734.3073	750.0106	15.2690
66	2.46676	1.5418E-02	.092133	.375589	5.58621E-02	.1011371	.0146016	.19783	256.2228	698.1573	709.6468	15.1026
67	2.62600	1.6374E-02	.071338	.355084	4.79591E-02	.0789511	.0092266	.15754	198.3916	660.0427	667.7598	14.9529
68	2.83235	1.7388E-02	.048336	.332472	3.82001E-02	.0548893	.0045097	.11031	134.4232	618.0095	622.3311	14.8216
69	3.23758	1.8463E-02	.017251	.302456	1.94147E-02	.0235358	.0006297	.04128	47.9740	562.2162	563.1356	14.7135
70	8.38467	1.9604E-02	.000517	.280121	3.25138E-03	.0010692	.0000006	.00128	1.4368	520.6980	520.7186	14.6960
71	11.56509	2.0814E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (52) X= 9.32663 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TGT	PTOT *
1	0.00000	0.	.675023	.832984	1.16738E-01	.6941013	.4468364	.99664	1877.2379	1548.3778	1829.1637	27.1379
2	.06938	2.0814E-05	.675023	.832984	1.16738E-01	.6941013	.4468364	.99664	1877.2379	1548.3778	1829.1637	27.1379
3	.09961	4.2890E-05	.673505	.832066	1.17201E-01	.6927169	.4449475	.99491	1873.0179	1546.6727	1826.5500	27.0853
4	.12388	6.6304E-05	.671605	.830913	1.17767E-01	.6909779	.4425916	.99274	1867.7335	1544.5284	1823.2666	27.0197
5	.14529	9.1139E-05	.669476	.829619	1.18384E-01	.6890275	.4399602	.99031	1861.8119	1542.1239	1819.5843	26.9464
6	.16502	1.1748E-04	.667166	.828214	1.19034E-01	.6869093	.4371157	.98767	1855.3873	1539.5126	1815.5853	26.8672
7	.18368	1.4542E-04	.664694	.826710	1.19708E-01	.6846408	.4340848	.98485	1848.5141	1536.7153	1811.3023	26.7828
8	.20162	1.7505E-04	.662070	.825109	1.20401E-01	.6822290	.4308803	.98184	1841.2158	1533.7405	1806.7488	26.6936
9	.21909	2.0648E-04	.659296	.823415	1.21109E-01	.6796765	.4275087	.97866	1833.5011	1530.5906	1801.9292	26.5997
10	.23625	2.3982E-04	.656372	.821625	1.21829E-01	.6769823	.4239728	.97531	1825.3709	1527.2648	1796.8429	26.5013
11	.25321	2.7517E-04	.653298	.819740	1.22558E-01	.6741451	.4202738	.97178	1816.8212	1523.7602	1791.4864	26.3983
12	.27009	3.1267E-04	.650070	.817756	1.23294E-01	.6711618	.4164115	.96807	1807.8451	1520.0725	1785.8540	26.2907
13	.28694	3.5245E-04	.646686	.815671	1.24033E-01	.6680288	.4123851	.96417	1798.4333	1516.1966	1779.9388	26.1786
14	.30385	3.9464E-04	.643141	.813482	1.24775E-01	.6647417	.4081931	.96009	1788.5751	1512.1266	1773.7327	26.0619
15	.32085	4.3938E-04	.639431	.811184	1.25516E-01	.6612957	.4038341	.95580	1778.2583	1507.8557	1767.2267	25.9405
16	.33800	4.8684E-04	.635552	.808774	1.26254E-01	.6576658	.3993061	.95132	1767.4701	1503.3767	1760.4113	25.8145
17	.35535	5.3718E-04	.631498	.806249	1.26986E-01	.6539066	.3946075	.94663	1756.1966	1498.6819	1753.2761	25.6836
18	.37292	5.9057E-04	.627265	.803603	1.27710E-01	.6499522	.3897363	.94172	1744.4230	1493.7632	1745.8102	25.5480
19	.39075	6.4720E-04	.622846	.800831	1.28423E-01	.6458167	.3846909	.93659	1732.1344	1488.6118	1738.0024	25.4075
20	.40889	7.0726E-04	.618236	.797930	1.29122E-01	.6414938	.3794694	.93123	1719.3147	1483.2185	1729.8407	25.2621
21	.42735	7.7097E-04	.613430	.794893	1.29804E-01	.6369769	.3740706	.92562	1705.9479	1477.5738	1721.3128	25.1118
22	.44618	8.3854E-04	.608420	.791716	1.30466E-01	.6322592	.3684930	.91978	1692.0170	1471.6675	1712.4059	24.9565
23	.46539	9.1021E-04	.603202	.788392	1.31104E-01	.6273339	.3627356	.91367	1677.5048	1465.4891	1703.1068	24.7962
24	.48503	9.8622E-04	.597768	.784916	1.31715E-01	.6221936	.3567976	.90731	1662.3937	1459.0275	1693.4019	24.6308
25	.50511	1.0668E-03	.592113	.781281	1.32296E-01	.6168309	.3506784	.90066	1646.6658	1452.2713	1683.2771	24.4604
26	.52568	1.1524E-03	.586229	.777481	1.32843E-01	.6112382	.3443779	.89374	1630.3027	1445.2082	1672.7181	24.2850
27	.54676	1.2431E-03	.580110	.773510	1.33351E-01	.6054077	.3378963	.88651	1613.2858	1437.8259	1661.7101	24.1045
28	.56838	1.3392E-03	.573749	.769360	1.33816E-01	.5993313	.3312342	.87899	1595.5962	1430.1112	1650.2379	23.9190
29	.59057	1.4413E-03	.567139	.765023	1.34235E-01	.5930009	.3243925	.87115	1577.2149	1422.0506	1638.2861	23.7285
30	.61336	1.5495E-03	.560274	.760493	1.34602E-01	.5864081	.3173728	.86298	1558.1226	1413.6298	1625.8389	23.5331
31	.63679	1.6643E-03	.553146	.755761	1.34914E-01	.5795444	.3101771	.85448	1538.3001	1404.8341	1612.8802	23.3327
32	.66090	1.7860E-03	.545749	.750820	1.35164E-01	.5724011	.3028077	.84563	1517.7280	1395.6483	1599.3936	23.1275
33	.68571	1.9152E-03	.538075	.745659	1.35349E-01	.5649694	.2952679	.83641	1496.3869	1386.0565	1585.3626	22.9176
34	.71127	2.0521E-03	.530118	.740272	1.35462E-01	.5572405	.2875612	.82683	1474.2574	1376.0423	1570.7784	22.7030
35	.73762	2.1974E-03	.521870	.734646	1.35498E-01	.5492054	.2796919	.81685	1451.3205	1365.5867	1555.6001	22.4839
36	.76479	2.3514E-03	.513325	.728779	1.35452E-01	.5408550	.2716650	.80648	1427.5571	1354.6779	1539.8546	22.2604
37	.79283	2.5149E-03	.504476	.722653	1.35318E-01	.5321804	.2634862	.79570	1402.9488	1343.2919	1523.4568	22.0326
38	.82178	2.6882E-03	.495317	.716262	1.35089E-01	.5231724	.2551616	.78448	1377.4773	1331.4120	1506.4498	21.8008
39	.85170	2.8720E-03	.485841	.709595	1.34759E-01	.5138221	.2466985	.77283	1351.1250	1319.0167	1488.7964	21.5652
40	.88264	3.0670E-03	.476043	.702641	1.34322E-01	.5041206	.2381047	.76071	1323.8751	1306.0923	1470.4800	21.3259
41	.91465	3.2738E-03	.465916	.695389	1.33771E-01	.4940591	.2293890	.74813	1295.7113	1292.6126	1451.4839	21.0832
42	.94779	3.4932E-03	.455454	.687829	1.33099E-01	.4836291	.2205607	.73506	1266.6186	1278.5587	1431.7921	20.8374
43	.98212	3.7258E-03	.444654	.679948	1.32298E-01	.4728223	.2116304	.72148	1236.5829	1263.9095	1411.3888	20.5887
44	1.01772	3.9726E-03	.433510	.671735	1.31363E-01	.4616307	.2026094	.70739	1205.5916	1248.6435	1390.2591	20.3375
45	1.05465	4.2343E-03	.422018	.663179	1.30284E-01	.4500467	.1935097	.69275	1173.6332	1232.7390	1368.3885	20.0842
46	1.09301	4.5119E-03	.410176	.654267	1.29054E-01	.4380632	.1843446	.67756	1140.6982	1216.1740	1345.7636	19.8290
47	1.13287	4.8064E-03	.397979	.644989	1.27665E-01	.4256736	.1751281	.66179	1106.7789	1198.9265	1322.3721	19.5723
48	1.17433	5.1187E-03	.385426	.635331	1.26110E-01	.4128721	.1658753	.64543	1071.8693	1180.9742	1298.2027	19.3147
49	1.21750	5.4499E-03	.372516	.625282	1.24379E-01	.3996532	.1566022	.62845	1035.9659	1162.2953	1273.2456	19.0565
50	1.26250	5.8012E-03	.359248	.614831	1.22465E-01	.3860128	.1473258	.61083	999.0675	1142.8678	1247.4924	18.7982

PROFILES-- STA (52) X= 9.32663 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS TI	** TTD	PTD	MACH **	U	** DIMENSIONAL T	TOT **	PTOT *
51	1.30946	6.1739E-03	.345622	.603965	1.20359E-01	.3719472	.1380642	.59256	961.1754	1122.6704	1220.9365	18.5403
52	1.35852	6.5691E-03	.331641	.592674	1.18052E-01	.3574539	.1288366	.57360	922.2935	1101.6820	1193.5731	18.2834
53	1.40986	6.9883E-03	.317306	.580946	1.15535E-01	.3425314	.1196630	.55392	882.4284	1079.8819	1165.3994	18.0279
54	1.46366	7.4329E-03	.302621	.568771	1.12800E-01	.3271792	.1105648	.53352	841.5894	1057.2502	1136.4145	17.7746
55	1.52013	7.9045E-03	.287590	.556138	1.09837E-01	.3113980	.1015645	.51234	799.7885	1033.7675	1106.6197	17.5240
56	1.57953	8.4047E-03	.272219	.543037	1.06636E-01	.2951895	.0926856	.49036	757.0397	1009.4149	1076.0180	17.2768
57	1.64216	8.9352E-03	.256512	.529458	1.03188E-01	.2785562	.0839532	.46754	713.3588	984.1738	1044.6142	17.0336
58	1.70837	9.4979E-03	.240475	.515391	9.94816E-02	.2615011	.0753934	.44383	668.7623	958.0250	1012.4142	16.7953
59	1.77858	1.0095E-02	.224116	.500824	9.55061E-02	.2440275	.0670341	.41918	623.2659	930.9488	979.4240	16.5625
60	1.85332	1.0728E-02	.207437	.485747	9.12489E-02	.2261380	.0589050	.39354	576.8824	902.9228	945.6487	16.3362
61	1.93325	1.1399E-02	.190442	.470145	8.66962E-02	.2078343	.0510378	.36682	529.6196	873.9213	911.0912	16.1171
62	2.01920	1.2111E-02	.173130	.454001	8.18307E-02	.1891151	.0434673	.33894	481.4759	843.9126	875.7494	15.9063
63	2.11229	1.2866E-02	.155495	.437292	7.66286E-02	.1699730	.0362316	.30977	432.4306	812.8528	839.6092	15.7048
64	2.21408	1.3668E-02	.137513	.420002	7.10552E-02	.1503889	.0293708	.27923	382.4223	780.7136	802.6343	15.5138
65	2.32682	1.4517E-02	.119133	.402135	6.50559E-02	.1303549	.0229273	.24722	331.3091	747.5023	764.8101	15.3344
66	2.45404	1.5418E-02	.100253	.383638	5.85369E-02	.1099075	.0169521	.21300	278.8026	713.1195	726.2054	15.1680
67	2.60185	1.6374E-02	.080662	.364324	5.13120E-02	.0888715	.0115142	.17586	224.3198	677.2175	686.4895	15.0166
68	2.78287	1.7388E-02	.059849	.343762	4.29060E-02	.0668201	.0066965	.13433	166.4402	638.9961	644.8565	14.8825
69	3.03945	1.8463E-02	.035201	.319701	3.05372E-02	.0414036	.0024838	.08193	97.8936	594.2718	596.8700	14.7652
70	4.02155	1.9604E-02	.005154	.287643	9.86426E-03	.0085725	.0000591	.01265	14.3346	534.6799	534.8849	14.6976
71	4.85057	2.0814E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (54) X= 11.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS TI	TTD **	PTD	MACH **	U	** DIMENSIONAL T	TOT **	PTOT *
1	0.00000	0.	.549657	.757625	1.13458E-01	.5752654	.3047191	.84812	1528.5961	1408.2987	1604.8014	23.1807
2	.07332	2.0814E-05	.549657	.757625	1.13458E-01	.5752654	.3047191	.84812	1528.5961	1408.2987	1604.8014	23.1807
3	.10527	4.2890E-05	.548808	.757064	1.13620E-01	.5744773	.3038749	.84710	1526.2341	1407.2557	1603.3135	23.1572
4	.13091	6.6304E-05	.547738	.756343	1.13819E-01	.5734704	.3028204	.84582	1523.2597	1405.9146	1601.4126	23.1279
5	.15352	9.1139E-05	.546532	.755524	1.14040E-01	.5723299	.3016359	.84439	1519.9058	1404.3926	1599.2593	23.0949
6	.17435	1.1748E-04	.545215	.754626	1.14276E-01	.5710812	.3003463	.84282	1516.2429	1402.7243	1596.9016	23.0590
7	.19403	1.4542E-04	.543796	.753657	1.14524E-01	.5697336	.2989613	.84113	1512.2975	1400.9226	1594.3574	23.0204
8	.21296	1.7505E-04	.542279	.752618	1.14784E-01	.5682905	.2974847	.83932	1508.0787	1398.9920	1591.6329	22.9793
9	.23137	2.0648E-04	.540664	.751511	1.15053E-01	.5667522	.2959175	.83739	1503.5876	1396.9329	1588.7286	22.9357
10	.24944	2.3982E-04	.538950	.750333	1.15331E-01	.5651174	.2942593	.83535	1498.8207	1394.7434	1585.6421	22.8895
11	.26731	2.7517E-04	.537135	.749083	1.15617E-01	.5633838	.2925087	.83318	1493.7716	1392.4202	1582.3690	22.8407
12	.28507	3.1267E-04	.535215	.747759	1.15910E-01	.5615484	.2906638	.83088	1488.4322	1389.9592	1578.9037	22.7894
13	.30280	3.5245E-04	.533187	.746358	1.16210E-01	.5596076	.2887223	.82846	1482.7929	1387.3554	1575.2394	22.7353
14	.32058	3.9464E-04	.531048	.744878	1.16515E-01	.5575575	.2866818	.82589	1476.8432	1384.6032	1571.3689	22.6785
15	.33844	4.3938E-04	.528792	.743314	1.16825E-01	.5553939	.2845394	.82319	1470.5717	1381.6968	1567.2840	22.6188
16	.35646	4.8684E-04	.526417	.741664	1.17138E-01	.5531122	.2822924	.82034	1463.9662	1378.6297	1562.9762	22.5563
17	.37466	5.3718E-04	.523917	.739924	1.17453E-01	.5507077	.2799379	.81734	1457.0139	1375.3950	1558.4364	22.4907
18	.39309	5.9057E-04	.521288	.738090	1.17769E-01	.5481752	.2774730	.81417	1449.7015	1371.9855	1553.6552	22.4221
19	.41178	6.4720E-04	.518524	.736157	1.18085E-01	.5455097	.2748947	.81084	1442.0151	1368.3937	1548.6226	22.3503
20	.43078	7.0726E-04	.515620	.734123	1.18399E-01	.5427054	.2721999	.80734	1433.9403	1364.6117	1543.3282	22.2753
21	.45010	7.7097E-04	.512572	.731981	1.18710E-01	.5397569	.2693860	.80366	1425.4623	1360.6311	1537.7613	22.1969
22	.46979	8.3854E-04	.509373	.729728	1.19015E-01	.5366581	.2664498	.79979	1416.5658	1356.4435	1531.9108	22.1151
23	.48988	9.1021E-04	.506018	.727359	1.19313E-01	.5334030	.2633888	.79572	1407.2351	1352.0396	1525.7651	22.0299
24	.51038	9.8622E-04	.502501	.724869	1.19602E-01	.5299853	.2602001	.79145	1397.4542	1347.4103	1519.3125	21.9411
25	.53135	1.0668E-03	.498816	.722252	1.19878E-01	.5263985	.2568812	.78697	1387.2066	1342.5457	1512.5407	21.8487
26	.55279	1.1524E-03	.494957	.719503	1.20141E-01	.5226359	.2534297	.78227	1376.4755	1337.4359	1505.4370	21.7526
27	.57475	1.2431E-03	.490918	.716616	1.20387E-01	.5186908	.2498433	.77734	1365.2437	1332.0702	1497.9886	21.6527
28	.59726	1.3392E-03	.486693	.713586	1.20614E-01	.5145560	.2461200	.77217	1353.4939	1326.4379	1490.1821	21.5491
29	.62033	1.4413E-03	.482276	.710407	1.20817E-01	.5102244	.2422579	.76675	1341.2083	1320.5276	1482.0040	21.4415
30	.64402	1.5495E-03	.477659	.707071	1.20995E-01	.5056886	.2382553	.76107	1328.3689	1314.3277	1473.4404	21.3301
31	.66835	1.6643E-03	.472836	.703574	1.21144E-01	.5009410	.2341109	.75512	1314.9575	1307.8260	1464.4769	21.2147
32	.69335	1.7860E-03	.467801	.699907	1.21261E-01	.4959739	.2298237	.74890	1300.9558	1301.0102	1455.0991	21.0953
33	.71906	1.9152E-03	.462548	.696064	1.21340E-01	.4907796	.2253928	.74239	1286.3451	1293.8671	1445.2922	20.9719
34	.74551	2.0521E-03	.457068	.692038	1.21379E-01	.4853500	.2208180	.73557	1271.1069	1286.3836	1435.0412	20.8446
35	.77275	2.1974E-03	.451357	.687822	1.21374E-01	.4796771	.2160991	.72845	1255.2225	1278.5456	1424.3307	20.7132
36	.80081	2.3514E-03	.445406	.683407	1.21319E-01	.4737526	.2112367	.72100	1238.6730	1270.3391	1413.1453	20.5778
37	.82973	2.5149E-03	.439209	.678786	1.21210E-01	.4675685	.2062315	.71321	1221.4398	1261.7493	1401.4693	20.4384
38	.85956	2.6882E-03	.432760	.673950	1.21043E-01	.4611158	.2010848	.70508	1203.5043	1252.7610	1389.2869	20.2951
39	.89035	2.8720E-03	.426051	.668892	1.20812E-01	.4543867	.1957985	.69659	1184.8480	1243.3587	1376.5824	20.1479
40	.92214	3.0670E-03	.419077	.663603	1.20512E-01	.4473726	.1903750	.68772	1165.4529	1233.5265	1363.3397	19.9969
41	.95498	3.2738E-03	.411831	.658073	1.20138E-01	.4400650	.1848171	.67846	1145.3010	1223.2479	1349.5431	19.8421
42	.98894	3.4932E-03	.404306	.652294	1.19683E-01	.4324556	.1791284	.66880	1124.3750	1212.5060	1335.1765	19.6837
43	1.02406	3.7258E-03	.396497	.646257	1.19143E-01	.4245361	.1733131	.65872	1102.6579	1201.2838	1320.2245	19.5218
44	1.06042	3.9726E-03	.388398	.639952	1.18510E-01	.4162983	.1673760	.64822	1080.1335	1189.5635	1304.6715	19.3565
45	1.09808	4.2343E-03	.380002	.633369	1.17779E-01	.4077342	.1613227	.63726	1056.7861	1177.3275	1288.5024	19.1879
46	1.13712	4.5119E-03	.371306	.626499	1.16943E-01	.3988358	.1551596	.62584	1032.6012	1164.5574	1271.7023	19.0163
47	1.17760	4.8064E-03	.362303	.619332	1.15995E-01	.3895957	.1488937	.61394	1007.5649	1151.2349	1254.2569	18.8419
48	1.21963	5.1187E-03	.352990	.611858	1.14928E-01	.3800065	.1425329	.60155	981.6646	1137.3413	1236.1525	18.6647
49	1.26329	5.4499E-03	.343362	.604066	1.13736E-01	.3700614	.1360860	.58863	954.8890	1122.8579	1217.3761	18.4852
50	1.30869	5.8012E-03	.333415	.595947	1.12412E-01	.3597538	.1295626	.57519	927.2280	1107.7657	1197.9155	18.3036

PROFILES-- STA (54)   X= 11.00000   PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS TI	TTD **	PTD	MACH **	U	** DIMENSIONAL T	TOT **	PTOT *
51	1.35593	6.1739E-03	.323147	.587490	1.10947E-01	.3490778	.1229731	.56119	898.6730	1092.0458	1177.7591	18.1201
52	1.40515	6.5641E-03	.312556	.578685	1.09335E-01	.3380279	.1163292	.54662	869.2173	1075.6793	1156.8969	17.9351
53	1.45648	6.9883E-03	.301638	.569523	1.07567E-01	.3265992	.1096433	.53146	838.8555	1058.6475	1135.3194	17.7490
54	1.51008	7.4329E-03	.290393	.559992	1.05636E-01	.3147875	.1029288	.51567	807.5843	1040.9316	1113.0189	17.5620
55	1.56612	7.9045E-03	.278821	.550083	1.03534E-01	.3025892	.0962003	.49925	775.4020	1022.5130	1089.9887	17.3746
56	1.62480	8.4047E-03	.266922	.539787	1.01253E-01	.2900017	.0894735	.48216	742.3091	1003.3737	1066.2234	17.1873
57	1.68635	8.9352E-03	.254695	.529093	9.87843E-02	.2770227	.0827651	.46437	708.3073	983.4953	1041.7191	17.0005
58	1.75103	9.4979E-03	.242143	.517992	9.61189E-02	.2636510	.0760931	.44586	673.4004	962.8599	1016.4732	16.8148
59	1.81914	1.0095E-02	.229268	.506473	9.32479E-02	.2498855	.0694769	.42659	637.5930	941.4494	990.4840	16.6305
60	1.89105	1.0728E-02	.216070	.494528	9.01618E-02	.2357261	.0629371	.40652	600.8902	919.2453	963.7509	16.4484
61	1.96719	1.1399E-02	.202552	.482146	8.68500E-02	.2211722	.0564959	.38561	563.2969	896.2281	936.2733	16.2691
62	2.04807	1.2111E-02	.188715	.469314	8.33011E-02	.2062234	.0501773	.36380	524.8159	872.3768	908.0500	16.0932
63	2.13436	1.2866E-02	.174558	.456021	7.95018E-02	.1908779	.0440069	.34103	485.4457	847.6669	879.0775	15.9213
64	2.22688	1.3668E-02	.160078	.442250	7.54363E-02	.1751314	.0380127	.31723	445.1766	822.0686	849.3482	15.7544
65	2.32670	1.4517E-02	.145266	.427973	7.10847E-02	.1589890	.0322253	.29221	403.9851	795.5313	818.8713	15.5933
66	2.43527	1.5418E-02	.130104	.413201	6.64201E-02	.1423652	.0266773	.26635	361.8186	768.0716	787.4856	15.4388
67	2.55463	1.6374E-02	.114552	.397945	6.14027E-02	.1253917	.0213997	.23896	318.5692	739.7129	755.4395	15.2919
68	2.68786	1.7388E-02	.098538	.382135	5.59694E-02	.1080109	.0164360	.20976	274.0338	710.3259	722.6246	15.1537
69	2.83991	1.8463E-02	.081921	.365644	5.00112E-02	.0901060	.0118364	.17828	227.8235	679.6708	688.8201	15.0256
70	3.01992	1.9604E-02	.064400	.348200	4.33049E-02	.0714178	.0076597	.14362	179.0962	647.2461	653.5368	14.9043
71	3.24971	2.0814E-02	.045059	.329061	3.51635E-02	.0511990	.0039580	.10337	125.3083	611.6693	615.3637	14.8062
72	3.65375	2.2097E-02	.019141	.304289	2.00048E-02	.0253870	.0007708	.04566	53.2324	565.6220	566.6306	14.7175
73	7.84955	2.3458E-02	.000774	.280827	3.97654E-03	.0017697	.0000014	.00192	2.1538	522.0103	522.0413	14.6960
74	10.62111	2.4901E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (56) X= 13.00000 PRESSURE= 14.6960

		*		** DIMENSIONLESS		**		**		** DIMENSIONAL **		*
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	.446805	.688756	1.00399E-01	.4749582	.2108907	.72065	1242.5648	1280.2827	1415.4214	20.5681
2	.07754	2.0814E-05	.446805	.688756	1.00399E-01	.4749582	.2108907	.72065	1242.5648	1280.2827	1415.4214	20.5681
3	.11132	4.2890E-05	.446294	.688385	1.00465E-01	.4744706	.2104739	.72000	1241.1432	1279.5928	1414.5008	20.5565
4	.13843	6.6304E-05	.445649	.687905	1.00547E-01	.4738440	.2099526	.71920	1239.3497	1278.7003	1413.3178	20.5420
5	.16233	9.1139E-05	.444920	.687358	1.00637E-01	.4731318	.2093657	.71829	1237.3232	1277.6857	1411.9731	20.5257
6	.18434	1.1748E-04	.444123	.686757	1.00735E-01	.4723497	.2087250	.71729	1235.1052	1276.5662	1410.4966	20.5078
7	.20514	1.4542E-04	.443262	.686106	1.00838E-01	.4715035	.2080348	.71622	1232.7104	1275.3562	1408.8990	20.4886
8	.22513	1.7505E-04	.442338	.685406	1.00947E-01	.4705950	.2072965	.71506	1230.1431	1274.0562	1407.1837	20.4681
9	.24457	2.0648E-04	.441353	.684659	1.01060E-01	.4696241	.2065101	.71383	1227.4030	1272.6663	1405.3506	20.4462
10	.26365	2.3982E-04	.440304	.683862	1.01178E-01	.4685895	.2056749	.71252	1224.4864	1271.1846	1403.3974	20.4229
11	.28251	2.7517E-04	.439190	.683014	1.01300E-01	.4674895	.2047897	.71113	1221.3884	1269.6084	1401.3205	20.3983
12	.30124	3.1267E-04	.438009	.682113	1.01426E-01	.4663217	.2038529	.70965	1218.1025	1267.9344	1399.1156	20.3722
13	.31994	3.5245E-04	.436757	.681158	1.01556E-01	.4650834	.2028628	.70808	1214.6214	1266.1586	1396.7777	20.3446
14	.33868	3.9464E-04	.435432	.680145	1.01689E-01	.4637716	.2018176	.70642	1210.9370	1264.2767	1394.3010	20.3155
15	.35751	4.3938E-04	.434031	.679073	1.01825E-01	.4623831	.2007151	.70467	1207.0406	1262.2838	1391.6796	20.2848
16	.37649	4.8684E-04	.432551	.677939	1.01963E-01	.4609145	.1995533	.70281	1202.9230	1260.1750	1388.9069	20.2524
17	.39565	5.3718E-04	.430987	.676739	1.02104E-01	.4593621	.1983298	.70085	1198.5743	1257.9447	1385.9760	20.2184
18	.41505	5.9057E-04	.429336	.675471	1.02246E-01	.4577221	.1970424	.69877	1193.9842	1255.5873	1382.8796	20.1825
19	.43472	6.4720E-04	.427595	.674131	1.02389E-01	.4559904	.1956886	.69658	1189.1420	1253.0968	1379.6101	20.1448
20	.45470	7.0726E-04	.425759	.672716	1.02533E-01	.4541628	.1942661	.69427	1184.0364	1250.4668	1376.1596	20.1052
21	.47501	7.7097E-04	.423824	.671223	1.02676E-01	.4522348	.1927723	.69183	1178.6558	1247.6908	1372.5196	20.0636
22	.49570	8.3854E-04	.421786	.669647	1.02818E-01	.4502019	.1912047	.68925	1172.9881	1244.7618	1368.6815	20.0200
23	.51678	9.1021E-04	.419641	.667985	1.02957E-01	.4480593	.1895609	.68654	1167.0207	1241.6726	1364.6362	19.9742
24	.53831	9.8622E-04	.417383	.666233	1.03094E-01	.4458020	.1878381	.68368	1160.7408	1238.4157	1360.3745	19.9262
25	.56029	1.0668E-03	.415007	.664386	1.03226E-01	.4434249	.1860341	.68066	1154.1350	1234.9833	1355.8866	19.8760
26	.58277	1.1524E-03	.412510	.662441	1.03352E-01	.4409227	.1841460	.67749	1147.1696	1231.3673	1351.1624	19.8234
27	.60577	1.2431E-03	.409885	.660392	1.03472E-01	.4382900	.1821716	.67415	1139.8905	1227.5592	1346.1917	19.7685
28	.62933	1.3392E-03	.407128	.658236	1.03582E-01	.4355209	.1801083	.67064	1132.2232	1223.5502	1340.9657	19.7110
29	.65348	1.4413E-03	.404233	.655966	1.03683E-01	.4326097	.1779536	.66694	1124.1729	1219.3312	1335.4674	19.6510
30	.67824	1.5495E-03	.401195	.653578	1.03771E-01	.4295504	.1757053	.66305	1115.7244	1214.8928	1329.6914	19.5884
31	.70365	1.6643E-03	.398009	.651067	1.03845E-01	.4263367	.1733611	.65896	1106.8621	1210.2253	1323.6240	19.5231
32	.72975	1.7860E-03	.394667	.648427	1.03903E-01	.4229624	.1709188	.65466	1097.5703	1205.3184	1317.2533	19.4551
33	.75656	1.9152E-03	.391166	.645653	1.03942E-01	.4194209	.1683764	.65015	1087.8327	1200.1618	1310.5669	19.3843
34	.78412	2.0521E-03	.387498	.642739	1.03961E-01	.4157055	.1657320	.64541	1077.6330	1194.7447	1303.5523	19.3107
35	.81248	2.1974E-03	.383659	.639679	1.03955E-01	.4118095	.1629837	.64043	1066.9545	1189.0558	1296.1965	19.2342
36	.84166	2.3514E-03	.379641	.636466	1.03923E-01	.4077257	.1601302	.63521	1055.7803	1183.0836	1288.4864	19.1547
37	.87172	2.5149E-03	.375438	.633094	1.03861E-01	.4034471	.1571700	.62973	1044.0934	1176.8162	1280.4085	19.0723
38	.90268	2.6882E-03	.371045	.629557	1.03767E-01	.3989666	.1541019	.62399	1031.8765	1170.2413	1271.9491	18.9869
39	.93461	2.8720E-03	.366455	.625848	1.03636E-01	.3942766	.1509252	.61796	1019.1122	1163.3464	1263.0944	18.8984
40	.96753	3.0670E-03	.361662	.621959	1.03466E-01	.3893697	.1476391	.61165	1005.7830	1156.1183	1253.8302	18.8069
41	1.00151	3.2738E-03	.356660	.617884	1.03251E-01	.3842384	.1442435	.60504	991.8716	1148.5437	1244.1423	18.7124
42	1.03659	3.4932E-03	.351442	.613616	1.02989E-01	.3788749	.1407382	.59811	977.3604	1140.6090	1234.0161	18.6148
43	1.07283	3.7258E-03	.346002	.609145	1.02674E-01	.3732717	.1371238	.59086	962.2321	1132.2998	1223.4372	18.5141
44	1.11029	3.9726E-03	.340334	.604466	1.02303E-01	.3674209	.1334011	.58326	946.4692	1123.6019	1212.3910	18.4105
45	1.14903	4.2343E-03	.334432	.599570	1.01871E-01	.3613149	.1295711	.57532	930.0547	1114.5004	1200.8627	18.3038
46	1.18912	4.5119E-03	.328289	.594448	1.01373E-01	.3549457	.1256357	.56701	912.9718	1104.9802	1188.8377	18.1943
47	1.23063	4.8064E-03	.321900	.589093	1.00803E-01	.3483057	.1215970	.55832	895.2039	1095.0258	1176.3015	18.0818
48	1.27364	5.1187E-03	.315259	.583496	1.00157E-01	.3413873	.1174576	.54923	876.7348	1084.6216	1163.2395	17.9665
49	1.31824	5.4499E-03	.308360	.577648	9.94284E-02	.3341828	.1132208	.53973	857.5489	1073.7513	1149.6374	17.8486
50	1.36451	5.8012E-03	.301198	.571541	9.86119E-02	.3266849	.1088905	.52981	837.6311	1062.3988	1135.4812	17.7280

PROFILES-- STA (56) X= 13.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
51	1.41256	6.1739E-03	.293767	.565165	9.77016E-02	.3188861	.1044711	.51944	816.9670	1050.5476	1120.7572	17.6049
52	1.46249	6.5691E-03	.286064	.558512	9.66913E-02	.3107795	.0999678	.50861	795.5427	1038.1808	1105.4519	17.4795
53	1.51443	6.9883E-03	.278082	.551573	9.55745E-02	.3023582	.0953865	.49730	773.3454	1025.2815	1089.5524	17.3520
54	1.56850	7.4329E-03	.269818	.544338	9.43448E-02	.2936156	.0907338	.48549	750.3629	1011.8328	1073.0464	17.2224
55	1.62484	7.9045E-03	.261267	.536798	9.29952E-02	.2845454	.0860170	.47317	726.5843	997.8173	1055.9219	17.0911
56	1.68363	8.4047E-03	.252427	.528943	9.15189E-02	.2751418	.0812446	.46030	701.9995	983.2178	1038.1678	16.9582
57	1.74505	8.9352E-03	.243294	.520766	8.99086E-02	.2653990	.0764256	.44687	676.5992	968.0167	1019.7736	16.8240
58	1.80930	9.4979E-03	.233864	.512255	8.81568E-02	.2553121	.0715702	.43285	650.3756	952.1964	1000.7294	16.6888
59	1.87661	1.0095E-02	.224136	.503401	8.62557E-02	.2448761	.0666896	.41822	623.3214	935.7392	981.0261	16.5529
60	1.94725	1.0728E-02	.214107	.494195	8.41973E-02	.2340864	.0617959	.40295	595.4304	918.6269	960.6553	16.4167
61	2.02154	1.1399E-02	.203774	.484627	8.19732E-02	.2229389	.0569025	.38701	566.6967	900.8411	939.6088	16.2804
62	2.09984	1.2111E-02	.193137	.474686	7.95741E-02	.2114293	.0520241	.37036	537.1146	882.3622	917.8787	16.1446
63	2.18258	1.2866E-02	.182193	.464361	7.69906E-02	.1995533	.0471766	.35296	506.6779	863.1696	895.4568	16.0096
64	2.27028	1.3668E-02	.170938	.453640	7.42119E-02	.1873058	.0423776	.33477	475.3788	843.2403	872.3335	15.8760
65	2.36359	1.4517E-02	.159369	.442508	7.12260E-02	.1746802	.0376462	.31574	443.2063	822.5477	848.4964	15.7442
66	2.46329	1.5418E-02	.147481	.430947	6.80190E-02	.1616672	.0330037	.29581	410.1450	801.0586	823.9278	15.6150
67	2.57040	1.6374E-02	.135264	.418955	6.45743E-02	.1482500	.0284726	.27500	376.1692	778.7676	798.5962	15.4888
68	2.68625	1.7388E-02	.122701	.406542	6.08697E-02	.1344490	.0240756	.25324	341.2315	755.6946	772.5398	15.3664
69	2.81269	1.8463E-02	.109763	.393691	5.68748E-02	.1202901	.0198399	.23021	305.2519	731.8067	745.8078	15.2481
70	2.95232	1.9604E-02	.096404	.380352	5.25452E-02	.1057334	.0157989	.20570	268.0993	707.0113	718.3248	15.1359
71	3.10912	2.0814E-02	.082541	.366444	4.78107E-02	.0907085	.0119912	.17943	229.5478	681.1585	689.9578	15.0299
72	3.28972	2.2097E-02	.068022	.351821	4.25466E-02	.0750797	.0084622	.15091	189.1698	653.9768	660.4505	14.9316
73	3.50689	2.3458E-02	.052502	.336167	3.64825E-02	.0585392	.0052647	.11916	146.0083	624.8777	629.2220	14.8426
74	3.79497	2.4901E-02	.034802	.318429	2.86465E-02	.0400266	.0024375	.08116	96.7843	591.9061	594.2703	14.7639
75	4.45943	2.6432E-02	.010105	.293882	1.30420E-02	.0148158	.0002223	.02453	28.1016	546.2780	546.6722	14.7022
76	22.75904	2.8056E-02	.000086	.279216	1.05447E-03	.0001685	.0000000	.00021	.2393	519.0160	519.0182	14.6960
77	32.34606	2.9778E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (58) X= 15.00000 PRESSURE= 14.6960

N	Y	PSI*	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH**	U	** DIMENSIONAL ** T	TOT	PTOT*
1	0.00000	0.	.375246	.636215	8.70976E-02	.4033842	.1561543	.62797	1043.5589	1182.6172	1280.2895	19.0440
2	.08132	2.0814E-05	.375246	.636215	8.70976E-02	.4033842	.1561543	.62797	1043.5589	1182.6172	1280.2895	19.0440
3	.11675	4.2890E-05	.374903	.635947	8.71321E-02	.4030496	.1559132	.62752	1042.6065	1182.1202	1279.6578	19.0373
4	.14517	6.6304E-05	.374471	.635601	8.71750E-02	.4026188	.1556113	.62696	1041.4041	1181.4767	1278.8445	19.0289
5	.17023	9.1139E-05	.373982	.635206	8.72227E-02	.4021285	.1552711	.62632	1040.0444	1180.7429	1277.9189	19.0194
6	.19330	1.1748E-04	.373447	.634772	8.72742E-02	.4015896	.1548992	.62562	1038.5547	1179.9355	1276.9014	19.0091
7	.21510	1.4542E-04	.372868	.634301	8.73289E-02	.4010058	.1544979	.62487	1036.9447	1179.0605	1275.7993	18.9979
8	.23605	1.7505E-04	.372246	.633795	8.73865E-02	.4003785	.1540680	.62406	1035.2169	1178.1195	1274.6148	18.9859
9	.25643	2.0648E-04	.371582	.633253	8.74468E-02	.3997073	.1536094	.62319	1033.3706	1177.1125	1273.3475	18.9732
10	.27642	2.3962E-04	.370875	.632675	8.75097E-02	.3989913	.1531215	.62227	1031.4030	1176.0378	1271.9958	18.9596
11	.29617	2.7517E-04	.370122	.632060	8.75752E-02	.3982291	.1526033	.62129	1029.3104	1174.8935	1270.5568	18.9452
12	.31579	3.1267E-04	.369323	.631405	8.76430E-02	.3974190	.1520539	.62025	1027.0878	1173.6769	1269.0273	18.9299
13	.33537	3.5245E-04	.368475	.630710	8.77130E-02	.3965589	.1514721	.61914	1024.7299	1172.3846	1267.4035	18.9137
14	.35499	3.9464E-04	.367577	.629973	8.77852E-02	.3956467	.1508566	.61796	1022.2307	1171.0139	1265.6812	18.8965
15	.37470	4.3938E-04	.366625	.629191	8.78594E-02	.3946799	.1502059	.61672	1019.5836	1169.5605	1263.8558	18.8784
16	.39456	4.8684E-04	.365617	.628362	8.79353E-02	.3936558	.1495185	.61540	1016.7818	1168.0205	1261.9224	18.8593
17	.41461	5.3718E-04	.364552	.627485	8.80129E-02	.3925718	.1487929	.61401	1013.8178	1166.3899	1259.8758	18.8391
18	.43490	5.9057E-04	.363425	.626556	8.80917E-02	.3914249	.1480274	.61253	1010.6839	1164.6640	1257.7104	18.8177
19	.45547	6.4720E-04	.362234	.625574	8.81716E-02	.3902120	.1472203	.61097	1007.3720	1162.8382	1255.4205	18.7953
20	.47635	7.0726E-04	.360976	.624536	8.82522E-02	.3889299	.1463699	.60932	1003.8736	1160.9074	1252.9999	18.7716
21	.49758	7.7097E-04	.359647	.623436	8.83332E-02	.3875753	.1454743	.60757	1000.1796	1158.8665	1250.4423	18.7466
22	.51919	8.3854E-04	.358246	.622277	8.84140E-02	.3861445	.1445317	.60573	996.2809	1156.7100	1247.7410	18.7204
23	.54121	9.1021E-04	.356767	.621052	8.84942E-02	.3846339	.1435401	.60378	992.1677	1154.4322	1244.8890	18.6928
24	.56368	9 -622E-04	.355207	.619758	8.85733E-02	.3830396	.1424976	.60172	987.8301	1152.0270	1241.8791	18.6638
25	.58663	1 668E-03	.353563	.618392	8.86505E-02	.3813577	.1414022	.59955	983.2575	1149.4882	1238.7036	18.6333
26	.61008	1 1524E-03	.351830	.616951	8.87253E-02	.3795839	.1402519	.59726	978.4393	1146.8094	1235.3547	18.6012
27	.63407	1.2431E-03	.350005	.615431	8.87968E-02	.3777140	.1390446	.59485	973.3642	1143.9836	1231.8243	18.5676
28	.65863	1.3342E-03	.348084	.613828	8.88641E-02	.3757434	.1377784	.59230	968.0207	1141.0039	1228.1039	18.5324
29	.68379	1.4413E-03	.346061	.612138	8.89262E-02	.3736676	.1364511	.58961	962.3968	1137.8629	1224.1847	18.4954
30	.70958	1.5495E-03	.343934	.610358	8.89822E-02	.3714816	.1350607	.58678	956.4804	1134.5530	1220.0576	18.4567
31	.73603	1.6643E-03	.341697	.608482	8.90307E-02	.3691806	.1336050	.58380	950.2588	1131.0663	1215.7133	18.4162
32	.76318	1.7860E-03	.339345	.606506	8.90706E-02	.3667595	.1320822	.58066	943.7190	1127.3945	1211.1421	18.3738
33	.79106	1.9152E-03	.336874	.604427	8.91003E-02	.3642128	.1304901	.57735	936.8477	1123.5291	1206.3339	18.3294
34	.81971	2.0521E-03	.334279	.602239	8.91184E-02	.3615352	.1288268	.57387	929.6311	1119.4613	1201.2786	18.2831
35	.84916	2.1974E-03	.331555	.599936	8.91252E-02	.3587210	.1270905	.57021	922.0555	1115.1819	1195.9655	18.2348
36	.87946	2.3514E-03	.328697	.597515	8.91128E-02	.3557646	.1252791	.56636	914.1063	1110.6815	1190.3837	18.1843
37	.91064	2.5149E-03	.325699	.594970	8.90853E-02	.3526599	.1233910	.56231	905.7692	1105.9503	1184.5221	18.1318
38	.94274	2.6882E-03	.322556	.592295	8.90386E-02	.3494009	.1214245	.55805	897.0292	1100.9782	1178.3692	18.0770
39	.97580	2.8720E-03	.319263	.589485	8.89704E-02	.3459815	.1193780	.55357	887.8711	1095.7548	1171.9133	18.0200
40	1.00988	3.0670E-03	.315814	.586534	8.88781E-02	.3423952	.1172501	.54887	878.2797	1090.2694	1165.1424	17.9608
41	1.04502	3.2738E-03	.312204	.583436	8.87593E-02	.3386356	.1150395	.54394	868.2393	1084.5108	1158.0442	17.8992
42	1.08127	3.4932E-03	.308427	.580185	8.86112E-02	.3346961	.1127451	.53875	857.7343	1078.4676	1150.6064	17.8353
43	1.11868	3.7258E-03	.304476	.576775	8.84307E-02	.3305699	.1103660	.53331	846.7487	1072.1281	1142.8161	17.7691
44	1.15732	3.9726E-03	.300348	.573198	8.82146E-02	.3262502	.1079013	.52760	835.2665	1065.4802	1134.6606	17.7005
45	1.19723	4.2343E-03	.296034	.569449	8.79597E-02	.3217302	.1053507	.52161	823.2716	1058.5115	1126.1267	17.6294
46	1.23849	4.5119E-03	.291531	.565521	8.76624E-02	.3170027	.1027140	.51534	810.7478	1051.2093	1117.2013	17.5560
47	1.28117	4.8064E-03	.286832	.561406	8.73189E-02	.3120607	.0999910	.50875	797.6790	1043.5605	1107.8709	17.4802
48	1.32533	5.1187E-03	.281931	.557098	8.69252E-02	.3068972	.0971823	.50185	784.0490	1035.5518	1098.1221	17.4020
49	1.37105	5.4499E-03	.276822	.552588	8.64773E-02	.3015048	.0942886	.49463	769.8418	1027.1694	1087.9413	17.3214
50	1.41842	5.8012E-03	.271500	.547870	8.59708E-02	.2958766	.0913108	.48705	755.0415	1018.3994	1077.3151	17.2385

PROFILES-- STA (58) X= 15.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD **	PTD	MACH **	U	** DIMENSIONAL ** T	TOT **	PTOT *
51	1.46754	6.1739E-03	.265959	.542936	8.54010E-02	.2900051	.0882505	.47912	739.6325	1009.2275	1066.2299	17.1533
52	1.51849	6.5691E-03	.260194	.537778	8.47632E-02	.2838834	.0851096	.47082	723.5992	999.6392	1054.6721	17.0658
53	1.57139	6.9883E-03	.254199	.532387	8.40524E-02	.2775043	.0818904	.46213	706.9264	989.6195	1042.6283	16.9762
54	1.62635	7.4329E-03	.247968	.526757	8.32633E-02	.2708608	.0785959	.45304	689.5995	979.1533	1030.0853	16.8845
55	1.68351	7.9045E-03	.241497	.520878	8.23906E-02	.2639458	.0752295	.44353	671.6040	968.2254	1017.0299	16.7907
56	1.74300	8.4047E-03	.234781	.514742	8.14285E-02	.2567526	.0717952	.43357	652.9258	956.8201	1003.4491	16.6951
57	1.80499	8.9352E-03	.227814	.508341	8.03710E-02	.2492745	.0682975	.42316	633.5517	944.9215	989.3304	16.5977
58	1.86964	9.4979E-03	.220593	.501666	7.92121E-02	.2415049	.0647420	.41227	613.4687	932.5135	974.6614	16.4987
59	1.93715	1.0095E-02	.213112	.494708	7.79454E-02	.2334374	.0611344	.40089	592.6644	919.5798	959.4299	16.3983
60	2.00774	1.0728E-02	.205367	.487458	7.65640E-02	.2250657	.0574818	.38898	571.1268	906.1035	943.6242	16.2965
61	2.08166	1.1399E-02	.197355	.479907	7.50610E-02	.2163839	.0537917	.37653	548.8446	892.0678	927.2329	16.1939
62	2.15921	1.2111E-02	.189071	.472046	7.34289E-02	.2073859	.0500728	.36350	525.8066	877.4551	910.2447	16.0902
63	2.24070	1.2866E-02	.180511	.463865	7.16599E-02	.1980658	.0463344	.34988	502.0018	862.2472	892.6483	15.9862
64	2.32654	1.3668E-02	.171672	.455353	6.97456E-02	.1884176	.0425873	.33562	477.4188	846.4253	874.4326	15.8818
65	2.41716	1.4517E-02	.162548	.446500	6.76771E-02	.1784352	.0388431	.32070	452.0457	829.9692	855.5858	15.7776
66	2.51312	1.5418E-02	.153135	.437294	6.54443E-02	.1681121	.0351149	.30507	425.8690	812.8573	836.0957	15.6738
67	2.61508	1.6374E-02	.143428	.427717	6.30362E-02	.1574511	.0314173	.28860	398.8726	795.0538	815.9678	15.5708
68	2.72386	1.7388E-02	.133418	.417770	6.04400E-02	.1463856	.0277665	.27163	371.0351	776.5647	795.0760	15.4691
69	2.84051	1.8463E-02	.123094	.407467	5.76404E-02	.1350008	.0241766	.25376	342.3242	757.4131	773.5815	15.3692
70	2.96638	1.9604E-02	.112438	.396788	5.46177E-02	.1232839	.0206675	.23489	312.6914	737.5623	751.4601	15.2715
71	3.10330	2.0814E-02	.101426	.385705	5.13463E-02	.1112149	.0172618	.21491	282.0655	716.9614	728.6738	15.1766
72	3.25384	2.2097E-02	.090017	.374179	4.77906E-02	.0987614	.0139852	.19365	250.3361	695.5357	705.1616	15.0854
73	3.42177	2.3458E-02	.078145	.362145	4.38972E-02	.0858684	.0108674	.17088	217.3223	673.1680	680.8195	14.9986
74	3.61314	2.4901E-02	.065697	.349498	3.95781E-02	.0724368	.0079432	.14624	182.7024	649.6579	655.4608	14.9172
75	3.83892	2.6432E-02	.052434	.336028	3.46611E-02	.0582675	.0052533	.11903	145.8200	624.6196	628.7091	14.8423
76	4.12407	2.8056E-02	.037727	.321229	2.86614E-02	.0428569	.0028403	.08760	104.9192	597.1115	599.6139	14.7751
77	4.58453	2.9778E-02	.018524	.302562	1.79311E-02	.0235984	.0007260	.04432	51.5159	562.4120	563.2538	14.7162
78	8.15641	3.1605E-02	.001128	.281375	4.23008E-03	.0023121	.0000029	.00280	3.1358	523.0298	523.0652	14.6961
79	10.71429	3.3542E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (63) X= 20.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
1	0.00000	0.	.265675	.546775	6.27609E-02	.2904200	.0874011	.47705	738.8433	1016.3641	1067.0131	17.1296
2	.12071	3.7777E-05	.265675	.546775	6.27609E-02	.2904200	.0874011	.47705	738.8433	1016.3641	1067.0131	17.1296
3	.17329	7.7844E-05	.265383	.546517	6.27845E-02	.2901205	.0872415	.47663	738.0306	1015.8842	1066.4477	17.1252
4	.21549	1.2034E-04	.265014	.546185	6.28135E-02	.2897363	.0870411	.47610	737.0046	1015.2666	1065.7223	17.1196
5	.25270	1.6542E-04	.264597	.545807	6.28458E-02	.2892994	.0868153	.47550	735.8445	1014.5636	1064.8975	17.1133
6	.28696	2.1322E-04	.264140	.545391	6.28803E-02	.2888196	.0865683	.47485	734.5738	1013.7910	1063.9915	17.1064
7	.31934	2.6393E-04	.263646	.544941	6.29167E-02	.2883000	.0863018	.47414	733.2005	1012.9543	1063.0107	17.0990
8	.35046	3.1771E-04	.263116	.544457	6.29548E-02	.2877419	.0860164	.47339	731.7270	1012.0551	1061.9569	17.0911
9	.38073	3.7476E-04	.262550	.543940	6.29944E-02	.2871450	.0857118	.47258	730.1526	1011.0931	1060.8300	17.0826
10	.41044	4.3526E-04	.261947	.543388	6.30353E-02	.2865085	.0853879	.47171	728.4753	1010.0671	1059.6283	17.0736
11	.43981	4.9944E-04	.261306	.542800	6.30775E-02	.2858312	.0850440	.47080	726.6915	1008.9751	1058.3495	17.0640
12	.46898	5.6750E-04	.260625	.542176	6.31208E-02	.2851115	.0846794	.46982	724.7975	1007.8144	1056.9907	17.0538
13	.49811	6.3969E-04	.259902	.541513	6.31651E-02	.2843477	.0842934	.46878	722.7885	1006.5823	1055.5486	17.0431
14	.52729	7.1626E-04	.259137	.540810	6.32101E-02	.2835378	.0838851	.46769	720.6595	1005.2755	1054.0195	17.0317
15	.55662	7.9748E-04	.258326	.540065	6.32557E-02	.2826797	.0834536	.46652	718.4052	1003.8907	1052.3994	17.0197
16	.58618	8.8362E-04	.257468	.539276	6.33017E-02	.2817711	.0829979	.46529	716.0195	1002.4240	1050.6841	17.0070
17	.61604	9.7498E-04	.256561	.538441	6.33479E-02	.2808097	.0825170	.46398	713.4965	1000.8716	1048.8689	16.9936
18	.64627	1.0719E-03	.255602	.537557	6.33938E-02	.2797929	.0820099	.46260	710.8295	999.2292	1046.9492	16.9795
19	.67692	1.1747E-03	.254589	.536623	6.34394E-02	.2787180	.0814754	.46114	708.0118	997.4926	1044.9198	16.9646
20	.70805	1.2837E-03	.253519	.535635	6.34841E-02	.2775823	.0809124	.45960	705.0361	995.6569	1042.7755	16.9490
21	.73971	1.3993E-03	.252389	.534592	6.35276E-02	.2763827	.0803197	.45796	701.8951	993.7175	1040.5108	16.9325
22	.77196	1.5219E-03	.251198	.533490	6.35694E-02	.2751163	.0796962	.45624	698.5810	991.6692	1038.1197	16.9151
23	.80484	1.6520E-03	.249941	.532327	6.36091E-02	.2737798	.0790406	.45442	695.0856	989.5068	1035.5964	16.8968
24	.83840	1.7900E-03	.248616	.531099	6.36460E-02	.2723699	.0783516	.45249	691.4007	987.2247	1032.9345	16.8777
25	.87269	1.9363E-03	.247219	.529804	6.36795E-02	.2708831	.0776280	.45046	687.5174	984.8171	1030.1275	16.8575
26	.90776	2.0915E-03	.245749	.528438	6.37090E-02	.2693160	.0768686	.44832	683.4268	982.2782	1027.1687	16.8364
27	.94366	2.2561E-03	.244200	.526998	6.37336E-02	.2676647	.0760720	.44606	679.1196	979.6016	1024.0511	16.8142
28	.98043	2.4307E-03	.242570	.525481	6.37525E-02	.2659254	.0752369	.44368	674.5862	976.7809	1020.7672	16.7909
29	1.01812	2.6159E-03	.240855	.523882	6.37648E-02	.2640941	.0743621	.44116	669.8166	973.8093	1017.3098	16.7666
30	1.05679	2.8123E-03	.239051	.522199	6.37695E-02	.2621667	.0734463	.43852	664.8008	970.6800	1013.6709	16.7411
31	1.09649	3.0207E-03	.237155	.520426	6.37654E-02	.2601390	.0724881	.43573	659.5280	967.3857	1009.8425	16.7144
32	1.13727	3.2416E-03	.235163	.518561	6.37513E-02	.2580065	.0714865	.43279	653.9877	963.9189	1005.8164	16.6865
33	1.17919	3.4760E-03	.233070	.516599	6.37259E-02	.2557648	.0704400	.42969	648.1687	960.2719	1001.5841	16.6574
34	1.22231	3.7246E-03	.230874	.514536	6.36878E-02	.2534093	.0693476	.42644	642.0597	956.4367	997.1369	16.6269
35	1.26668	3.9882E-03	.228569	.512367	6.36354E-02	.2509351	.0682082	.42301	635.6491	952.4051	992.4656	16.5952
36	1.31237	4.2679E-03	.226151	.510088	6.35670E-02	.2483373	.0670205	.41940	628.9251	948.1685	987.5611	16.5621
37	1.35945	4.5645E-03	.223616	.507694	6.34808E-02	.2456111	.0657838	.41561	621.8755	943.7181	982.4138	16.5277
38	1.40799	4.8790E-03	.220959	.505180	6.33749E-02	.2427511	.0644969	.41162	614.4880	939.0450	977.0142	16.4919
39	1.45806	5.2127E-03	.218177	.502541	6.32473E-02	.2397522	.0631591	.40743	606.7502	934.1397	971.3523	16.4546
40	1.50974	5.5666E-03	.215264	.499772	6.30956E-02	.2366090	.0617697	.40302	598.6492	928.9926	965.4179	16.4159
41	1.56311	5.9420E-03	.212216	.496868	6.29176E-02	.2333159	.0603281	.39839	590.1721	923.5939	959.2007	16.3758
42	1.61827	6.3401E-03	.209028	.493822	6.27106E-02	.2298676	.0588337	.39353	581.3059	917.9335	952.6901	16.3342
43	1.67531	6.7624E-03	.205695	.490631	6.24720E-02	.2262582	.0572863	.38843	572.0372	912.0007	945.8756	16.2911
44	1.73433	7.2102E-03	.202212	.487287	6.21990E-02	.2224819	.0556857	.38307	562.3528	905.7851	938.7461	16.2465
45	1.79544	7.6853E-03	.198576	.483785	6.18884E-02	.2185331	.0540320	.37744	552.2390	899.2754	931.2906	16.2005
46	1.85877	8.1891E-03	.194780	.480119	6.15371E-02	.2144056	.0523254	.37154	541.6824	892.4605	923.4979	16.1530
47	1.92443	8.7235E-03	.190820	.476282	6.11417E-02	.2100936	.0505665	.36534	530.6693	885.3288	915.3568	16.1040
48	1.99258	9.2904E-03	.186690	.472268	6.06985E-02	.2055909	.0487560	.35885	519.1859	877.8683	906.8557	16.0536
49	2.06336	9.8915E-03	.182387	.468072	6.02038E-02	.2008914	.0468949	.35203	507.2184	870.0670	897.9830	16.0018
50	2.13694	1.0529E-02	.177905	.463685	5.96535E-02	.1959889	.0449847	.34489	494.7532	861.9123	888.7272	15.9486

PROFILES-- STA (63) X= 20.00000 PRESSURE= 14.6960

		*		** DIMENSIONLESS		**		**	** DIMENSIONAL		** *
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
51	2.21351	1.1206E-02	.173239	.459101	5.90434E-02	.1908773	.0430270	.33740	481.7763	853.3915	879.0764	15.8941
52	2.24328	1.1923E-02	.168383	.454313	5.83690E-02	.1855501	.0410239	.32954	468.2739	844.4913	869.0187	15.8383
53	2.37647	1.2684E-02	.163334	.449313	5.76255E-02	.1800011	.0389780	.32131	454.2321	835.1982	858.5421	15.7813
54	2.46334	1.3491E-02	.158086	.444095	5.68080E-02	.1742238	.0368922	.31268	439.6369	825.4982	847.6346	15.7232
55	2.55418	1.4347E-02	.152634	.438650	5.59110E-02	.1682116	.0347699	.30363	424.4742	815.3768	836.2837	15.6641
56	2.64933	1.5254E-02	.146972	.432970	5.49290E-02	.1619580	.0326152	.29414	408.7295	804.8190	824.4768	15.6042
57	2.74915	1.6217E-02	.141096	.427043	5.38558E-02	.1554644	.0304327	.28413	392.3882	793.8020	812.2168	15.5434
58	2.85408	1.7239E-02	.135000	.420868	5.26849E-02	.1486851	.0282282	.27384	375.4351	782.3231	799.4137	15.4820
59	2.96465	1.8322E-02	.128678	.414448	5.14092E-02	.1416582	.0260058	.26303	357.8529	770.3896	786.1508	15.4201
60	3.08145	1.9471E-02	.122122	.407775	5.00208E-02	.1343838	.0237722	.25166	339.6221	757.9857	772.4166	15.3579
61	3.20523	2.0689E-02	.115326	.400839	4.85107E-02	.1268529	.0215350	.23971	320.7206	745.0935	758.1984	15.2956
62	3.33687	2.1982E-02	.108278	.393630	4.68688E-02	.1190576	.0193029	.22711	301.1223	731.6927	743.4809	15.2335
63	3.47749	2.3352E-02	.100969	.386134	4.50829E-02	.1109881	.0170857	.21382	280.7956	717.7590	728.2456	15.1717
64	3.62850	2.4806E-02	.093384	.378335	4.31387E-02	.1026318	.0148947	.19979	259.7007	703.2624	712.4690	15.1107
65	3.79172	2.6349E-02	.085503	.370213	4.10180E-02	.0939720	.0127426	.18492	237.7848	688.1647	696.1193	15.0508
66	3.96964	2.7984E-02	.077301	.361740	3.86970E-02	.0849852	.0106443	.16913	214.9752	672.4143	679.1521	14.9924
67	4.16573	2.9719E-02	.068740	.352876	3.61430E-02	.0756364	.0086168	.15228	191.1652	655.9376	661.5015	14.9359
68	4.38517	3.1559E-02	.059758	.343561	3.33074E-02	.0658702	.0066800	.13416	166.1871	638.6222	643.0630	14.8820
69	4.63633	3.3511E-02	.050251	.333692	3.01112E-02	.0555903	.0048574	.11448	139.7487	620.2785	623.6546	14.8313
70	4.93458	3.5581E-02	.040006	.323073	2.64017E-02	.0446054	.0031763	.09262	111.2580	600.5389	602.9150	14.7844
71	5.31620	3.7777E-02	.028451	.311211	2.17509E-02	.0324280	.0016660	.06711	79.1227	578.4895	579.9241	14.7424
72	5.97325	4.0105E-02	.012827	.295727	1.27925E-02	.0166468	.0003561	.03104	35.6727	549.7073	550.1292	14.7059
73	13.25815	4.2575E-02	.000481	.279948	2.24377E-03	.0008929	.0000005	.00120	1.3371	520.3759	520.3858	14.6960
74	18.01038	4.5195E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (64) X= 21.00000 PRESSURE= 14.6960

		*			** DIMENSIONLESS **				**	** DIMENSIONAL **		*
N	Y	PSI	UD	TMD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
1	0.00000	0.	.250884	.533795	5.92232E-02	.2748387	.0794393	.45555	697.7079	992.2360	1037.5957	16.9079
2	.12273	3.7777E-05	.250884	.533795	5.92232E-02	.2748387	.0794393	.45555	697.7079	992.2360	1037.5957	16.9079
3	.17619	7.7844E-05	.250625	.533563	5.92438E-02	.2745718	.0793035	.45517	696.9892	991.8040	1037.0918	16.9042
4	.21910	1.2034E-04	.250299	.533264	5.92693E-02	.2742297	.0791330	.45470	696.0818	991.2487	1036.4459	16.8994
5	.25693	1.6542E-04	.249930	.532924	5.92977E-02	.2738409	.0789406	.45416	695.0556	990.6170	1035.7118	16.8941
6	.29176	2.1322E-04	.249526	.532551	5.93280E-02	.2734138	.0787302	.45357	693.9313	989.9228	1034.9054	16.8882
7	.32468	2.6393E-04	.249089	.532146	5.93602E-02	.2729514	.0785031	.45294	692.7160	989.1709	1034.0324	16.8819
8	.35632	3.1771E-04	.248620	.531711	5.93938E-02	.2724545	.0782598	.45226	691.4118	988.3628	1033.0943	16.8751
9	.38709	3.7476E-04	.248119	.531246	5.94289E-02	.2719231	.0780001	.45153	690.0180	987.4983	1032.0909	16.8679
10	.41729	4.3526E-04	.247585	.530750	5.94653E-02	.2713562	.0777237	.45075	688.5326	986.5760	1031.0208	16.8602
11	.44713	4.9944E-04	.247016	.530222	5.95028E-02	.2707529	.0774302	.44993	686.9526	985.5942	1029.8817	16.8520
12	.47679	5.6750E-04	.246413	.529660	5.95415E-02	.2701118	.0771189	.44905	685.2744	984.5505	1028.6712	16.8433
13	.50639	6.3969E-04	.245773	.529064	5.95811E-02	.2694311	.0767892	.44812	683.4938	983.4424	1027.3861	16.8342
14	.53605	7.1626E-04	.245094	.528432	5.96215E-02	.2687092	.0764403	.44713	681.6064	982.2668	1026.0232	16.8244
15	.56585	7.9748E-04	.244375	.527762	5.96627E-02	.2679442	.0760714	.44608	679.6071	981.0207	1024.5788	16.8142
16	.59589	8.8362E-04	.243614	.527051	5.97043E-02	.2671339	.0756816	.44497	677.4907	979.7007	1023.0490	16.8033
17	.62623	9.7498E-04	.242809	.526300	5.97463E-02	.2662763	.0752701	.44379	675.2517	978.3031	1021.4298	16.7919
18	.65694	1.0719E-03	.241958	.525504	5.97884E-02	.2653689	.0748358	.44255	672.8840	976.8241	1019.7167	16.7798
19	.68807	1.1747E-03	.241058	.524662	5.98303E-02	.2644094	.0743779	.44123	670.3816	975.2598	1017.9052	16.7670
20	.71970	1.2837E-03	.240107	.523773	5.98718E-02	.2633953	.0738953	.43984	667.7379	973.6058	1015.9905	16.7536
21	.75186	1.3993E-03	.239103	.522832	5.99125E-02	.2623237	.0733869	.43837	664.9461	971.8577	1013.9674	16.7394
22	.78461	1.5219E-03	.238044	.521839	5.99521E-02	.2611921	.0728518	.43681	661.9991	970.0110	1011.8308	16.7245
23	.81800	1.6520E-03	.236925	.520784	5.99901E-02	.2599973	.0722887	.43516	658.8897	968.0606	1009.5751	16.7088
24	.85208	1.7900E-03	.235746	.519682	6.00261E-02	.2587365	.0716965	.43343	655.6101	966.0017	1007.1946	16.6923
25	.88689	1.9363E-03	.234503	.518513	6.00595E-02	.2574064	.0710742	.43159	652.1523	963.8287	1004.6834	16.6750
26	.92250	2.0915E-03	.233192	.517280	6.00898E-02	.2560037	.0704205	.42966	648.5082	961.5364	1002.0352	16.6568
27	.95893	2.2561E-03	.231812	.515979	6.01163E-02	.2545251	.0697343	.42761	644.6692	959.1188	999.2435	16.6377
28	.99625	2.4307E-03	.230358	.514608	6.01382E-02	.2529670	.0690144	.42546	640.6264	956.5701	996.3018	16.6177
29	1.03450	2.6159E-03	.228828	.513163	6.01549E-02	.2513257	.0682596	.42318	636.3707	953.8841	993.2031	16.5967
30	1.07374	2.8123E-03	.227218	.511640	6.01655E-02	.2495975	.0674687	.42079	631.8928	951.0543	989.9402	16.5746
31	1.11401	3.0207E-03	.225524	.510037	6.01689E-02	.2477784	.0666406	.41826	627.1829	948.0740	986.5057	16.5516
32	1.15538	3.2416E-03	.223744	.508349	6.01642E-02	.2458644	.0657739	.41560	622.2310	944.9364	982.8921	16.5274
33	1.19788	3.4760E-03	.221872	.506573	6.01502E-02	.2438513	.0648677	.41279	617.0269	941.6342	979.0913	16.5022
34	1.24160	3.7246E-03	.219907	.504704	6.01256E-02	.2417347	.0639208	.40984	611.5600	938.1602	975.0954	16.4758
35	1.28658	3.9882E-03	.217842	.502738	6.00892E-02	.2395104	.0629320	.40673	605.8196	934.5065	970.8958	16.4483
36	1.33289	4.2679E-03	.215676	.500672	6.00395E-02	.2371737	.0619002	.40346	599.7945	930.6654	966.4841	16.4196
37	1.38059	4.5645E-03	.213403	.498500	5.99749E-02	.2347200	.0608246	.40001	593.4735	926.6285	961.8515	16.3896
38	1.42976	4.8790E-03	.211019	.496219	5.98937E-02	.2321444	.0597042	.39639	586.8450	922.3876	956.9887	16.3584
39	1.48046	5.2127E-03	.208521	.493823	5.97942E-02	.2294420	.0585380	.39258	579.8972	917.9338	951.8867	16.3260
40	1.53279	5.5666E-03	.205904	.491307	5.96743E-02	.2266078	.0573252	.38857	572.6180	913.2583	946.5358	16.2922
41	1.58681	5.9420E-03	.203163	.488668	5.95319E-02	.2236367	.0560652	.38436	564.9953	908.3518	940.9263	16.2571
42	1.64262	6.3401E-03	.200294	.485899	5.93649E-02	.2205234	.0547574	.37993	557.0166	903.2047	935.0483	16.2207
43	1.70031	6.7624E-03	.197292	.482995	5.91708E-02	.2172625	.0534014	.37528	548.6693	897.8074	928.8918	16.1829
44	1.75999	7.2102E-03	.194153	.479951	5.89471E-02	.2138486	.0519967	.37040	539.9406	892.1497	922.4463	16.1438
45	1.82175	7.6853E-03	.190873	.476762	5.86911E-02	.2102761	.0505432	.36527	530.8176	886.2214	915.7014	16.1033
46	1.88572	8.1891E-03	.187446	.473422	5.83999E-02	.2065394	.0490409	.35989	521.2873	880.0118	908.6465	16.0615
47	1.95203	8.7235E-03	.183868	.469924	5.80705E-02	.2026327	.0474900	.35424	511.3363	873.5101	901.2706	16.0183
48	2.02080	9.2904E-03	.180134	.466263	5.76996E-02	.1985501	.0458909	.34831	500.9515	866.7050	893.5628	15.9738
49	2.09219	9.8915E-03	.176239	.462433	5.72838E-02	.1942859	.0442443	.34209	490.1194	859.5850	885.5120	15.9280
50	2.16636	1.0529E-02	.172178	.458427	5.68194E-02	.1898341	.0425511	.33556	478.8265	852.1385	877.1068	15.8808

PROFILES-- STA (64) X= 21.00000 PRESSURE= 14.6960

		*			** DIMENSIONLESS	**			**	** DIMENSIONAL	**	*
N	Y	PSI	UD	THD	TI	TTD	PTD	MACH	U	T	TOT	PTOT
51	2.24350	1.1206E-02	.167947	.454238	5.63027E-02	.1851885	.0408125	.32871	467.0593	844.3532	868.3359	15.8324
52	2.32378	1.1923E-02	.163540	.449861	5.57295E-02	.1803430	.0390300	.32153	454.8041	836.2168	859.1878	15.7828
53	2.40745	1.2684E-02	.158953	.445288	5.50956E-02	.1752916	.0372055	.31400	442.0472	827.7163	849.6506	15.7320
54	2.49473	1.3491E-02	.154180	.440512	5.43964E-02	.1700278	.0353413	.30610	428.7746	818.8386	839.7127	15.6801
55	2.58591	1.4347E-02	.149217	.435526	5.36271E-02	.1645454	.0334400	.29782	414.9724	809.5700	829.3618	15.6271
56	2.68129	1.5254E-02	.144058	.430322	5.27825E-02	.1588632	.0315040	.28899	400.6263	799.8963	818.6338	15.5732
57	2.78123	1.6217E-02	.138699	.424890	5.18572E-02	.1529001	.0295393	.28001	385.7218	789.8004	807.3755	15.5185
58	2.88613	1.7239E-02	.133133	.419230	5.08452E-02	.1467052	.0275480	.27058	370.2436	779.2789	795.6795	15.4631
59	2.99647	1.8322E-02	.127355	.413341	4.97401E-02	.1402806	.0255344	.26068	354.1752	768.3326	783.5498	15.4070
60	3.11279	1.9471E-02	.121359	.407216	4.85349E-02	.1336203	.0235039	.25026	337.4983	756.9467	770.9752	15.3505
61	3.23576	2.0689E-02	.115136	.400846	4.72218E-02	.1267179	.0214628	.23931	320.1926	745.1051	757.9435	15.2936
62	3.36617	2.1982E-02	.108679	.394220	4.57918E-02	.1195661	.0194182	.22778	302.2350	732.7895	744.4409	15.2367
63	3.50499	2.3352E-02	.101977	.387329	4.42349E-02	.1121563	.0173781	.21563	283.5982	719.9791	730.4512	15.1799
64	3.65343	2.4806E-02	.095020	.380157	4.25389E-02	.1044780	.0153517	.20280	264.2494	706.6489	715.9545	15.1235
65	3.81302	2.6349E-02	.087791	.372690	4.06894E-02	.0965179	.0133497	.18924	244.1467	692.7679	700.9258	15.0677
66	3.98580	2.7984E-02	.080271	.364904	3.86679E-02	.0882580	.0113840	.17487	223.2350	678.2965	685.3312	15.0130
67	4.17448	2.9719E-02	.072434	.356773	3.64502E-02	.0796736	.0094686	.15958	201.4383	663.1811	669.1237	14.9596
68	4.38296	3.1559E-02	.064238	.348253	3.40025E-02	.0707274	.0076198	.14325	178.6450	647.3447	652.2333	14.9082
69	4.61708	3.3511E-02	.055620	.339282	3.12740E-02	.0613602	.0058566	.12566	154.6790	630.6682	634.5480	14.8591
70	4.88642	3.5581E-02	.046469	.329748	2.81801E-02	.0514667	.0042016	.10649	129.2306	612.9458	615.8691	14.8130
71	5.20911	3.7777E-02	.036553	.319424	2.45530E-02	.0408267	.0026810	.08511	101.6542	593.7566	595.7808	14.7707
72	5.63094	4.0105E-02	.025186	.307676	1.98875E-02	.0288087	.0013202	.05975	70.0416	571.9187	573.0908	14.7328
73	6.48028	4.2575E-02	.009042	.291411	1.01648E-02	.0123077	.0001795	.02204	25.1460	541.6848	541.9369	14.7010
74	26.04547	4.5195E-02	.000109	.279236	9.58234E-04	.0001882	.0000000	.00027	.3033	519.0535	519.0553	14.6960
75	36.78765	4.7974E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* JET ANALYSIS PROGRAM *

PROFILES-- STA (72) X= 32.00000 PRESSURE= 14.6960

N	Y	PSI *	UD	THD	** DIMENSIONLESS ** TI	TTD	PTD	MACH **	U	** DIMENSIONAL ** T	TOT	PTOT *
1	0.00000	0.	.154985	.443889	3.56828E-02	.1717115	.0354422	.30661	431.0121	825.1158	842.8914	15.6829
2	.19184	6.8564E-05	.154985	.443889	3.56828E-02	.1717115	.0354422	.30661	431.0121	825.1158	842.8914	15.6829
3	.27541	1.4129E-04	.154814	.443717	3.56972E-02	.1715264	.0353765	.30633	430.5384	824.7968	842.5419	15.6810
4	.34249	2.1842E-04	.154599	.443499	3.57149E-02	.1712904	.0352937	.30597	429.9403	824.3898	842.0964	15.6787
5	.40163	3.0023E-04	.154356	.443250	3.57346E-02	.1710228	.0352004	.30557	429.2640	823.9280	841.5911	15.6761
6	.45610	3.8700E-04	.154090	.442977	3.57556E-02	.1707290	.0350982	.30513	428.5230	823.4211	841.0365	15.6733
7	.50759	4.7903E-04	.153802	.442682	3.57779E-02	.1704112	.0349879	.30465	427.7221	822.8726	840.4365	15.6702
8	.55707	5.7665E-04	.153493	.442365	3.58013E-02	.1700700	.0348697	.30414	426.8627	822.2835	839.7922	15.6669
9	.60522	6.8018E-04	.153162	.442026	3.58256E-02	.1697051	.0347435	.30360	425.9442	821.6536	839.1033	15.6634
10	.65248	7.9000E-04	.152810	.441665	3.58509E-02	.1693160	.0346093	.30301	424.9655	820.9819	838.3687	15.6597
11	.69919	9.0647E-04	.152436	.441281	3.58769E-02	.1689021	.0344668	.30239	423.9245	820.2671	837.5872	15.6557
12	.74562	1.0300E-03	.152038	.440872	3.59038E-02	.1684622	.0343156	.30174	422.8188	819.5075	836.7568	15.6515
13	.79197	1.1610E-03	.151617	.440438	3.59313E-02	.1679954	.0341555	.30104	421.6458	818.7013	835.8755	15.6470
14	.83842	1.3000E-03	.151170	.439978	3.59594E-02	.1675005	.0339860	.30029	420.4024	817.8464	834.9411	15.6423
15	.88512	1.4474E-03	.150696	.439491	3.59879E-02	.1669761	.0338069	.29951	419.0854	816.9404	833.9510	15.6373
16	.93219	1.6038E-03	.150195	.438975	3.60169E-02	.1664208	.0336177	.29868	417.6912	815.9810	832.9026	15.6321
17	.97975	1.7696E-03	.149664	.438429	3.60461E-02	.1658331	.0334179	.29779	416.2163	814.9655	831.7931	15.6265
18	1.02790	1.9455E-03	.149103	.437851	3.60754E-02	.1652116	.0332071	.29686	414.6567	813.8912	830.6195	15.6206
19	1.07675	2.1320E-03	.148511	.437239	3.61047E-02	.1645544	.0329848	.29587	413.0082	812.7552	829.3788	15.6144
20	1.12637	2.3299E-03	.147884	.436593	3.61337E-02	.1638599	.0327506	.29483	411.2667	811.5544	828.0675	15.6079
21	1.17685	2.5397E-03	.147223	.435911	3.61622E-02	.1631262	.0325039	.29372	409.4275	810.2857	826.6823	15.6011
22	1.22829	2.7623E-03	.146525	.435190	3.61899E-02	.1623514	.0322442	.29255	407.4861	808.9457	825.2196	15.5938
23	1.28075	2.9984E-03	.145788	.434429	3.62167E-02	.1615336	.0319710	.29132	405.4374	807.5309	823.6755	15.5862
24	1.33431	3.2488E-03	.145011	.433626	3.62421E-02	.1606706	.0316837	.29002	403.2764	806.0377	822.0463	15.5782
25	1.38907	3.5144E-03	.144192	.432778	3.62659E-02	.1597604	.0313818	.28864	400.9978	804.4622	820.3277	15.5698
26	1.44509	3.7961E-03	.143328	.431884	3.62876E-02	.1588005	.0310647	.28719	398.5960	802.8005	818.5155	15.5610
27	1.50245	4.0948E-03	.142418	.430942	3.63069E-02	.1577888	.0307319	.28565	396.0653	801.0485	816.6053	15.5517
28	1.56123	4.4117E-03	.141460	.429948	3.63231E-02	.1567424	.0303821	.28390	393.3998	799.2019	814.6298	15.5420
29	1.62153	4.7479E-03	.140451	.428900	3.63359E-02	.1556146	.0300162	.28222	390.5933	797.2538	812.5004	15.5318
30	1.68342	5.1044E-03	.139389	.427795	3.63446E-02	.1544261	.0296329	.28044	387.6394	795.2000	810.2565	15.5211
31	1.74699	5.4825E-03	.138271	.426632	3.63486E-02	.1531756	.0292316	.27857	384.5317	793.0383	807.8956	15.5099
32	1.81233	5.8835E-03	.137096	.425409	3.63471E-02	.1518603	.0288115	.27660	381.2631	790.7636	805.4124	15.4982
33	1.87953	6.3089E-03	.135860	.424121	3.63395E-02	.1504776	.0283723	.27453	377.8269	788.3711	802.8017	15.4860
34	1.94870	6.7601E-03	.134562	.422768	3.63250E-02	.1490244	.0279133	.27234	374.2156	785.8555	800.0581	15.4732
35	2.01994	7.2386E-03	.133197	.421346	3.63025E-02	.1474978	.0274340	.27003	370.4219	783.2116	797.1759	15.4599
36	2.09336	7.7461E-03	.131765	.419851	3.62711E-02	.1458947	.0269339	.26760	366.4379	780.4337	794.1494	15.4460
37	2.16907	8.2844E-03	.130261	.418282	3.62298E-02	.1442121	.0264124	.26504	362.2558	777.5163	790.9725	15.4314
38	2.24720	8.8554E-03	.128683	.416634	3.61774E-02	.1424466	.0258691	.26235	357.8674	774.4533	787.6392	15.4163
39	2.32787	9.4610E-03	.127028	.414905	3.61127E-02	.1405949	.0253036	.25951	353.2642	771.2388	784.1432	15.4006
40	2.41123	1.0103E-02	.125292	.413091	3.60343E-02	.1386536	.0247156	.25653	348.4377	767.8664	780.4780	15.3842
41	2.49741	1.0785E-02	.123473	.411188	3.59409E-02	.1366191	.0241045	.25339	343.3788	764.3296	776.6370	15.3672
42	2.58660	1.1507E-02	.121567	.409193	3.58308E-02	.1344879	.0234703	.25009	338.0785	760.6218	772.6133	15.3495
43	2.67894	1.2274E-02	.119571	.407103	3.57025E-02	.1322563	.0228127	.24661	332.5273	756.7361	768.4000	15.3312
44	2.77464	1.3087E-02	.117481	.404913	3.55541E-02	.1299205	.0221315	.24296	326.7156	752.6653	763.9900	15.3122
45	2.87388	1.3949E-02	.115294	.402619	3.53837E-02	.1274765	.0214266	.23911	320.6334	748.4021	759.3758	15.2926
46	2.97690	1.4863E-02	.113006	.400218	3.51894E-02	.1249205	.0206983	.23507	314.2705	743.9390	754.5500	15.2723
47	3.08392	1.5833E-02	.110614	.397705	3.49689E-02	.1222483	.0199465	.23082	307.6163	739.2681	749.5048	15.2514
48	3.19523	1.6862E-02	.108112	.395077	3.47199E-02	.1194557	.0191716	.22635	300.6599	734.3814	744.2324	15.2298
49	3.31109	1.7953E-02	.105498	.392327	3.44399E-02	.1165384	.0183739	.22165	293.3901	729.2704	738.7246	15.2076
50	3.43185	1.9110E-02	.102767	.389452	3.41262E-02	.1134920	.0175542	.21670	285.7952	723.9264	732.9730	15.1848

PROFILES-- STA (72) X= 32.00000 PRESSURE= 14.6960

		*		** DIMENSIONLESS		**		**		** DIMENSIONAL	**	*
N	Y	PSI	UD	THD	TI	TTO	PTD	MACH	U	T	TOT	PTOT
51	3.55786	2.0338E-02	.099915	.386447	3.37759E-02	.1103119	.0167131	.21151	277.8631	718.3405	726.9690	15.1614
52	3.68953	2.1640E-02	.096937	.383307	3.33860E-02	.1069934	.0158515	.20604	269.5813	712.5030	720.7037	15.1374
53	3.82732	2.3021E-02	.093828	.380026	3.29530E-02	.1035316	.0149706	.20029	260.9364	706.4042	714.1677	15.1128
54	3.97176	2.4485E-02	.090584	.376598	3.24734E-02	.0999213	.0140719	.19425	251.9147	700.0336	707.3515	15.0878
55	4.12344	2.6039E-02	.087199	.373019	3.19431E-02	.0961571	.0131571	.18788	242.5014	693.3802	700.2447	15.0624
56	4.28307	2.7667E-02	.083668	.369281	3.13577E-02	.0922335	.0122280	.18118	232.6807	686.4322	692.8368	15.0365
57	4.45147	2.9434E-02	.079984	.365378	3.07122E-02	.0881441	.0112873	.17413	222.4358	679.1770	685.1162	15.0103
58	4.62960	3.1288E-02	.076141	.361302	3.00008E-02	.0838825	.0103375	.16669	211.7478	671.6006	677.0702	14.9838
59	4.81864	3.3254E-02	.072131	.357045	2.92169E-02	.0794411	.0093819	.15885	200.5956	663.6876	668.6848	14.9572
60	5.02001	3.5339E-02	.067945	.352597	2.83526E-02	.0748111	.0084242	.15058	188.9544	655.4196	659.9433	14.9306
61	5.23548	3.7551E-02	.063572	.347947	2.73983E-02	.0699817	.0074686	.14182	176.7939	646.7747	650.8255	14.9040
62	5.46732	3.9896E-02	.058999	.343078	2.63428E-02	.0649396	.0065198	.13255	164.0759	637.7255	641.3060	14.8775
63	5.71847	4.2385E-02	.054208	.337974	2.51729E-02	.0596677	.0055835	.12270	150.7518	628.2377	631.3527	14.8515
64	5.99293	4.5024E-02	.049176	.332611	2.38719E-02	.0541444	.0046663	.11221	136.7586	618.2676	620.9246	14.8259
65	6.29633	4.7823E-02	.043873	.326956	2.24166E-02	.0483397	.0037761	.10097	122.0102	607.7561	609.9654	14.8011
66	6.63711	5.0791E-02	.038251	.320963	2.07726E-02	.0422096	.0029224	.08885	106.3774	596.6167	598.3917	14.7774
67	7.02896	5.3940E-02	.032234	.314556	1.88830E-02	.0356803	.0021163	.07563	89.6429	584.7070	586.0643	14.7549
68	7.49739	5.7280E-02	.025665	.307587	1.66376E-02	.0286076	.0013714	.06090	71.3742	571.7526	572.7111	14.7342
69	8.10425	6.0822E-02	.018119	.299676	1.37250E-02	.0206161	.0007012	.04355	50.3880	557.0482	557.6233	14.7155
70	9.22019	6.4579E-02	.007532	.289022	7.69493E-03	.0099014	.0001256	.01844	20.9454	537.2430	537.3938	14.6995
71	29.28283	6.8564E-02	.000138	.279280	8.98637E-04	.0002310	.0000000	.00034	.3825	519.1346	519.1362	14.6960
72	40.94878	7.2791E-02	0.000000	.279046	0.	-.0000000	0.0000000	0.00000	0.0000	518.7000	518.7000	14.6960

* J E T   A N A L Y S I S   P R O G R A M *

FREE JET   MIXING

NAME=   DAVE FERGUSON
IDENT=   NEAR FIELD--LAT. QUAD.

* SUMMARY - STATION DATA - JET PROPERTIES *

N	X	B	YJ	UC	TC	TJC	PTC	TTC	YSONIC	WJ
1	0.00000	.06897	1.03448	1.0000000	1.0000000	5.000000E-02	1.000000	1.000000	.989855	1.000000
2	.00010	.12132	1.05236	1.0000000	1.0000000	4.999284E-02	.966741	.999941	.989921	.999257
3	.00020	.12133	1.05237	1.0000000	1.0000000	4.998770E-02	.966741	.999940	.989921	.999260
4	.00030	.12135	1.05238	1.0000000	1.0000000	4.998256E-02	.966741	.999940	.989921	.999263
5	.00050	.12137	1.05240	1.0000000	1.0000000	4.997228E-02	.966741	.999939	.989921	.999269
6	.00080	.12141	1.05244	1.0000000	1.0000000	4.995688E-02	.966741	.999938	.989921	.999279
7	.00100	.12144	1.05247	1.0000000	1.0000000	4.994662E-02	.966741	.999937	.989921	.999286
8	.00200	.12159	1.05262	1.0000000	1.0000000	4.989542E-02	.966741	.999932	.989919	.999323
9	.00400	.12198	1.05302	1.0000000	1.0000000	4.979353E-02	.966741	.999923	.989911	.999419
10	.00600	.12253	1.05356	1.0000000	1.0000000	4.969242E-02	.966741	.999915	.989895	.999547
11	.00800	.12325	1.05429	1.0000000	1.0000000	4.959220E-02	.966741	.999906	.989873	.999711
12	.01000	.15881	1.05536	1.0000000	1.0000000	4.950395E-02	.966741	.999899	.989841	.999947
13	.01500	.14558	1.04213	1.0000000	1.0000000	4.930821E-02	.966741	.999882	.989731	1.000893
14	.01700	.14320	1.03975	1.0000000	1.0000000	4.922485E-02	.966741	.999875	.989678	1.001457
15	.02000	.14176	1.03831	1.0000000	1.0000000	4.909842E-02	.966741	.999864	.989596	1.002523
16	.04000	.15894	1.05549	1.0000000	1.0000000	4.832959E-02	.966741	.999799	.988998	1.010766
17	.06000	.18125	1.07780	1.0000000	1.0000000	4.763167E-02	.966741	.999741	.988429	1.018154
18	.08000	.21146	1.07353	1.0000000	1.0000000	4.708298E-02	.966741	.999697	.987799	1.024305
19	.10000	.22080	1.08287	1.0000000	1.0000000	4.659496E-02	.966741	.999657	.987157	1.029459
20	.12000	.23659	1.09866	1.0000000	1.0000000	4.612049E-02	.966741	.999619	.986566	1.036034
21	.20000	.29522	1.12281	1.0000000	1.0000000	4.452404E-02	.966741	.999494	.984084	1.055817
22	.25000	.30308	1.13067	1.0000000	1.0000000	4.371773E-02	.966741	.999433	.981944	1.069261
23	.30000	.32378	1.15137	1.0000000	1.0000000	4.297828E-02	.966741	.999377	.979778	1.081729
24	.34000	.36939	1.16250	1.0000000	1.0000000	4.246495E-02	.966741	.999339	.978143	1.091301
25	.40000	.38395	1.17706	1.0000000	1.0000000	4.176773E-02	.966741	.999289	.975944	1.105947
26	.45000	.40138	1.19449	1.0000000	1.0000000	4.122642E-02	.966741	.999250	.974302	1.117893
27	.50000	.44857	1.20719	1.0000000	1.0000000	4.074767E-02	.966741	.999216	.972660	1.128813
28	.55000	.46249	1.22111	1.0000000	1.0000000	4.030297E-02	.966741	.999185	.970972	1.140289
29	.60000	.47651	1.23513	1.0000000	1.0000000	3.988031E-02	.966741	.999155	.969278	1.152323
30	.65000	.52424	1.24838	1.0000000	1.0000000	3.948785E-02	.966741	.999129	.967579	1.163486
31	.70000	.53571	1.25985	1.0000000	1.0000000	3.912846E-02	.966741	.999104	.965850	1.174155
32	.80000	.56358	1.28772	1.0000000	1.0000000	3.845314E-02	.966741	.999059	.962487	1.196021
33	1.00000	.68041	1.33558	1.0000000	1.0000000	3.731465E-02	.966741	.998984	.955776	1.239478
34	1.20000	.76501	1.38570	1.0000000	1.0000000	3.637129E-02	.966741	.998924	.948987	1.283522
35	1.50000	.87163	1.45784	1.0000000	1.0000000	3.521018E-02	.966741	.998853	.938351	1.348979
36	1.70000	.95574	1.50746	1.0000000	1.0000000	3.455934E-02	.966741	.998813	.931019	1.393712
37	2.00000	1.09756	1.58031	1.0000000	1.0000000	3.372262E-02	.966741	.998764	.919609	1.458845
38	2.50000	1.27791	1.69170	1.0000000	1.0000000	3.258219E-02	.966741	.998699	.899314	1.569821
39	3.00000	1.50196	1.81231	1.0000000	1.0000000	3.166878E-02	.966741	.998648	.877369	1.686934
40	3.40000	1.65426	1.89564	1.0000000	1.0000000	3.105431E-02	.966741	.998615	.858505	1.781967
41	4.00000	1.93013	2.03358	1.0000000	1.0000004	3.027485E-02	.966741	.998574	.827889	1.932492
42	4.36646	4.23118	2.11559	.9999994	1.0000045	2.986605E-02	.966734	.998556	.807511	2.026931
43	5.00000	4.59968	2.29984	.9998939	1.0000017	2.926840E-02	.966453	.998462	.767921	2.190883
44	6.00000	5.02907	2.51454	.9947491	.9976059	2.957909E-02	.955871	.993315	.696988	2.462118
45	6.20000	5.12816	2.56408	.9899940	.9953563	3.118182E-02	.946202	.988607	.681266	2.508113
46	6.50000	5.26037	2.63018	.9759999	.9887204	3.759394E-02	.918125	.974931	.656496	2.606108
47	6.80000	5.37777	2.68889	.9516096	.9770602	4.990031E-02	.870567	.951499	.629976	2.682741
48	7.00000	5.51851	2.75926	.9307053	.9669418	5.983828E-02	.831197	.931674	.611182	2.757367
49	7.50000	5.77101	2.88550	.8719407	.9379061	8.278804E-02	.727044	.876714	.558467	2.911569
50	8.00000	6.00298	3.00149	.8128805	.9078024	9.898509E-02	.631504	.822020	.492900	3.064844

* SUMMARY - STATION DATA - JET PROPERTIES *

N	X	R	YJ	UC	TC	TIC	PTC	TTC	YSONIC	WJ
51	9.00000	6.56938	3.29469	.7057467	.8502749	1.148985E-01	.479702	.722755	.264357	3.392590
52	9.32663	6.82084	3.41042	.6750226	.8329837	1.167380E-01	.440886	.694101		3.523247
53	10.00000	7.21188	3.60594	.6189998	.8003200	1.172247E-01	.375161	.641396		3.756256
54	11.00000	7.68641	3.84321	.5496570	.7576251	1.134581E-01	.302271	.575265		4.110165
55	12.00000	8.42923	4.21462	.4933794	.7208511	1.072585E-01	.249507	.520737		4.490175
56	13.00000	9.00890	4.50445	.4468050	.6887561	1.003990E-01	.209893	.474958		4.841632
57	14.00000	9.41870	4.70935	.4079866	.6607696	9.356445E-02	.179519	.436328		5.220514
58	15.00000	10.09654	5.04827	.3752459	.6362148	8.709758E-02	.155692	.403384		5.620157
59	16.00000	10.90665	5.45332	.3471811	.6144078	8.117423E-02	.136539	.374857		6.018429
60	17.00000	11.59912	5.79956	.3223857	.5945114	7.584849E-02	.120571	.349427		6.404364
61	18.00000	12.23783	6.11891	.3010275	.5768978	7.101938E-02	.107517	.327332		6.794804
62	19.00000	12.60289	6.30145	.2822871	.5610845	6.667207E-02	.096588	.307819		7.167207
63	20.00000	13.00538	6.50269	.2656754	.5467753	6.276094E-02	.087310	.290420		7.530748
64	21.00000	13.60158	6.80079	.2508838	.5337950	5.922317E-02	.079371	.274839		7.889839
65	22.00000	14.62633	7.31317	.2376829	.5220227	5.599975E-02	.072542	.260864		8.270735
66	23.00000	15.34782	7.67391	.2258360	.5113024	5.305529E-02	.066622	.248265		8.692498
67	24.00000	15.53556	7.76778	.2150274	.5013907	5.040206E-02	.061392	.236728		9.084558
68	25.00000	16.01546	8.00773	.2051186	.4921876	4.800596E-02	.056745	.226110		9.414806
69	26.00000	17.21948	8.60974	.1961933	.4838048	4.576702E-02	.052679	.216506		9.822294
70	28.00000	18.01024	9.00512	.1803176	.4686733	4.187422E-02	.045735	.199349		10.540158
71	30.00000	18.82412	9.41206	.1668493	.4556003	3.853620E-02	.040138	.184697		11.297495
72	32.00000	19.97751	9.98876	.1549846	.4438891	3.568284E-02	.035439	.171712		12.084204
73	34.00000	21.13681	10.56840	.1448259	.4337368	3.319877E-02	.031592	.160546		12.839313
74	36.00000	22.26082	11.13041	.1358852	.4246917	3.103408E-02	.028344	.150676		13.572204

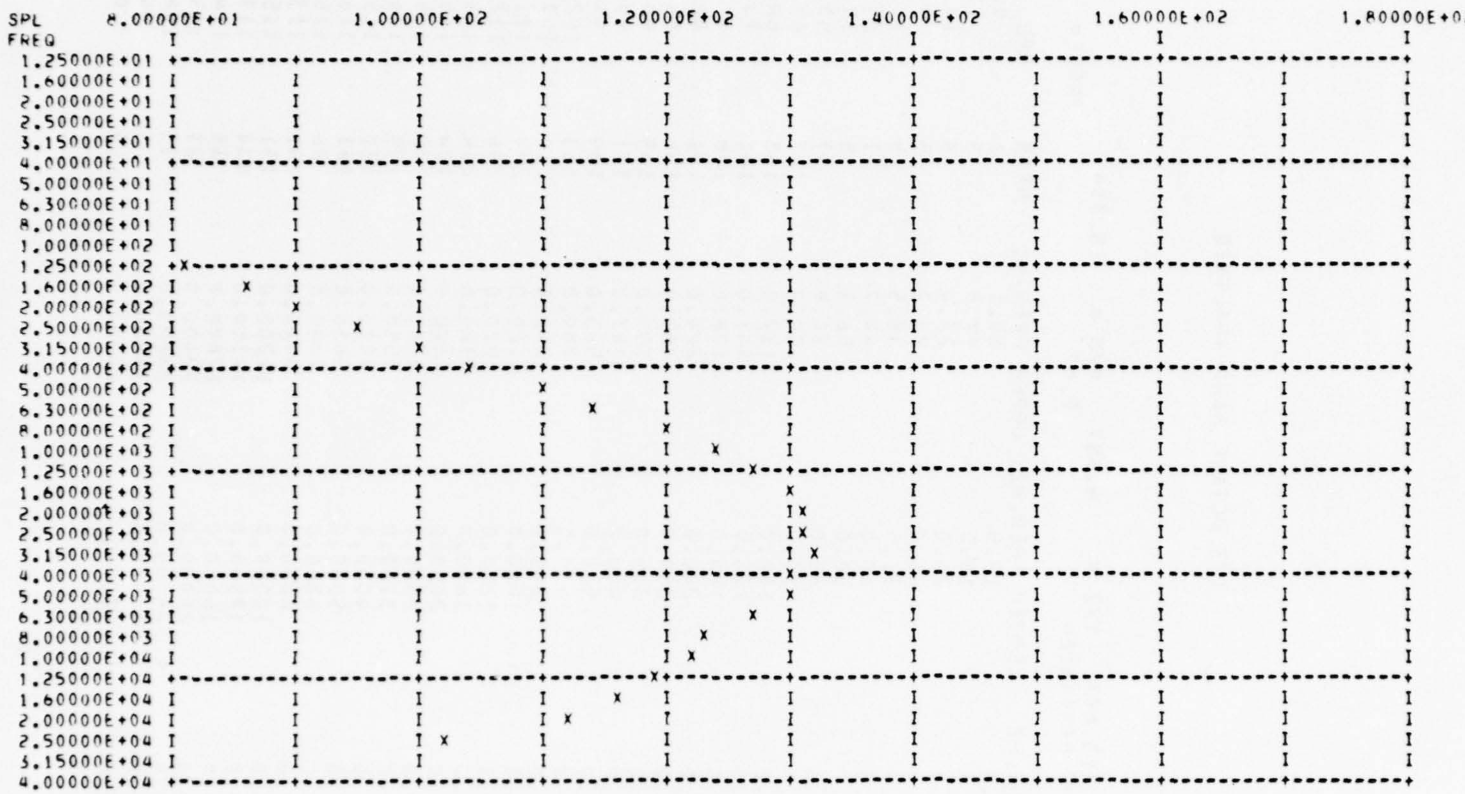
```
EXECUTING PROGM=NOISE
TAPIN= T      TAPOT= F
```

1/3 OCTAVE BAND ANALYSIS

X/D = .000 Y/D = 6.857 R/D = 6.857
SIDELINE DISTANCE= 2.60 ANGLE= 90.00

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	0.0000
14.1	16.0	17.8	5	12.3334
17.8	20.0	22.4	8	26.0390
22.4	25.0	28.2	5	14.9565
28.2	31.5	35.5	5	29.6719
35.5	40.0	44.7	11	40.4346
44.7	50.0	56.3	15	47.6497
56.3	63.0	70.9	37	58.2277
70.9	80.0	89.2	147	71.6895
89.2	100.0	112.0	103	75.5581
112.0	125.0	141.0	161	81.3884
141.0	160.0	178.0	178	85.7414
178.0	200.0	224.0	191	90.4295
224.0	250.0	282.0	156	94.9076
282.0	315.0	355.0	145	99.6651
355.0	400.0	447.0	171	104.3096
447.0	500.0	563.0	189	110.1286
563.0	630.0	709.0	163	113.8932
709.0	800.0	892.0	210	119.6428
892.0	1000.0	1120.0	284	124.1747
1120.0	1250.0	1410.0	246	126.8332
1410.0	1600.0	1780.0	234	130.1194
1780.0	2000.0	2240.0	124	131.2254
2240.0	2500.0	2820.0	172	131.1840
2820.0	3150.0	3550.0	195	131.6952
3550.0	4000.0	4470.0	130	129.9682
4470.0	5000.0	5630.0	161	129.8927
5630.0	6300.0	7090.0	86	127.4655
7090.0	8000.0	8920.0	141	123.0784
8920.0	10000.0	11200.0	131	122.4845
11200.0	12500.0	14100.0	434	118.7219
14100.0	16000.0	17800.0	38	116.4661
17800.0	20000.0	22400.0	23	112.2212
22400.0	25000.0	28200.0	39	101.9524
28200.0	31500.0	35500.0	3	74.4468
35500.0	40000.0	44700.0	0	0.0000

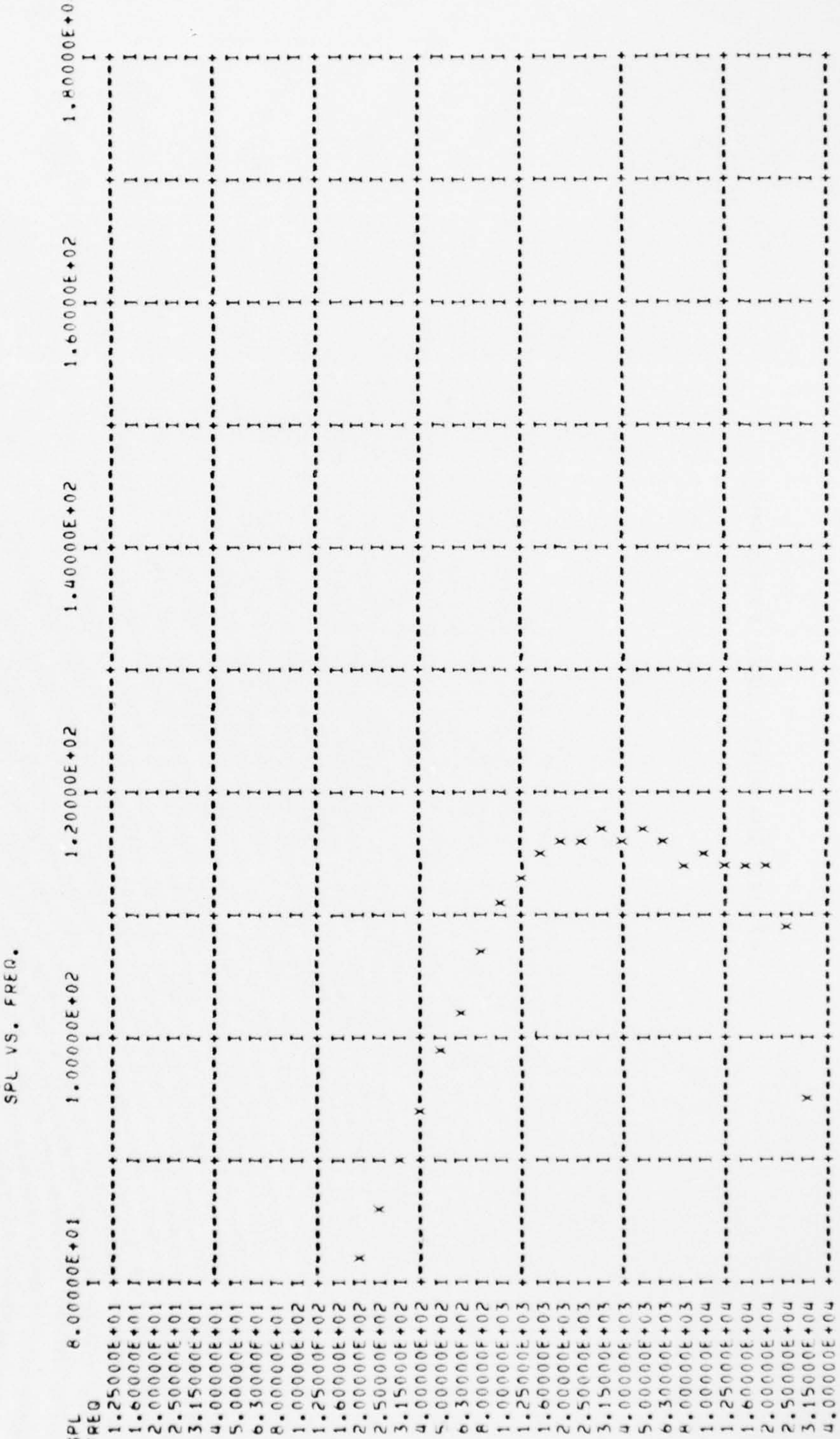
SPL VS. FREQ.


SPL
FREQ
8.00000E+01
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

1/3 OCTAVE BAND ANALYSIS

X/D = -13.693 Y/D = 6.857 R/D = 15.314
SIDELINE DISTANCE= 2.60 ANGLE= 153.40

LOWER FREQ,HZ	CENTER FREQ,HZ	UPPER FREQ,HZ	NPTS	SPL , DB
11.2	12.5	14.1	1	0.0000
14.1	16.0	17.8	5	1.5605
17.8	20.0	22.4	8	14.4717
22.4	25.0	28.2	5	0.0000
28.2	31.5	35.5	5	18.4729
35.5	40.0	44.7	11	29.7013
44.7	50.0	56.3	15	39.2610
56.3	63.0	70.9	37	50.8691
70.9	80.0	89.2	147	65.1495
89.2	100.0	112.0	103	68.5694
112.0	125.0	141.0	161	74.0417
141.0	160.0	178.0	178	77.8628
178.0	200.0	224.0	191	82.0509
224.0	250.0	282.0	156	85.9428
282.0	315.0	355.0	145	90.1270
355.0	400.0	447.0	171	94.0747
447.0	500.0	563.0	189	99.2437
563.0	630.0	709.0	163	102.2861
709.0	800.0	892.0	210	107.4037
892.0	1000.0	1120.0	284	111.1046
1120.0	1250.0	1410.0	246	112.9323
1410.0	1600.0	1780.0	234	115.4782
1780.0	2000.0	2240.0	124	115.9907
2240.0	2500.0	2820.0	172	115.7544
2820.0	3150.0	3550.0	195	116.5041
3550.0	4000.0	4470.0	130	115.5696
4470.0	5000.0	5630.0	161	116.5754
5630.0	6300.0	7090.0	86	115.9823
7090.0	8000.0	8920.0	141	113.5279
8920.0	10000.0	11200.0	131	115.0344
11200.0	12500.0	14100.0	434	113.7349
14100.0	16000.0	17800.0	38	114.1018
17800.0	20000.0	22400.0	23	113.5339
22400.0	25000.0	28200.0	39	108.6402
28200.0	31500.0	35500.0	3	94.8484
35500.0	40000.0	44700.0	0	0.0000


SPL VS. FREQ.
SPL
FREQ
8.00000E+01
1.00000E+02
1.20000E+02
1.40000E+02
1.60000E+02
1.80000E+02
1.25000E+01
1.60000E+01
2.00000E+01
2.50000E+01
3.15000E+01
4.00000E+01
5.00000E+01
6.30000E+01
8.00000E+01
1.00000E+02
1.25000E+02
1.60000E+02
2.00000E+02
2.50000E+02
3.15000E+02
4.00000E+02
5.00000E+02
6.30000E+02
8.00000E+02
1.00000E+03
1.25000E+03
1.60000E+03
2.00000E+03
2.50000E+03
3.15000E+03
4.00000E+03
5.00000E+03
6.30000E+03
8.00000E+03
1.00000E+04
1.25000E+04
1.60000E+04
2.00000E+04
2.50000E+04
3.15000E+04
4.00000E+04

*   J E T   A N A L Y S I S   P R O G R A M   *

*   S U M M A R Y   A C O U S T I C   A N A L Y S I S   *

LATERAL QUADRUPLE NEAR FIELD MODEL

* AERODYNAMIC PARAMETERS *

EXTERNAL CONDITIONS		JET DISCHARGE PARAMETERS		GAS PROPERTIES	
TE =	518.700	DIAJ =	4.55000	GAM =	1.40000
PE =	1.4696E+01	MJET =	1.3559	RG =	53.34000
VE =	0.000	TJET =	1858.833	PR =	.72000
ME =	0.0000	PTJET=	4.2540E+01	PRT =	1.00000
TIE=	0.	VJET =	2781.000	SC =	*00000000.000
		TIJET=	5.0000E-02	TREF =	*00000000.000
				NUREF=	1.0000E+15

* FAR FIELD NOISE PARAMETERS *

REFERENCE PRESSURE(PREFN)= 2.00000000E-04
AMBIENT SONIC VELOCITY(ASPEED)= 1116.35
SIDE-LINE DISTANCE (SLINE)= 2.6000

N	ANGLE,DEG.	SOUND PRES.	OASPL,DB	PNDB, DB	OCTAVE CENTER FREQ(HZ)-SPLS (63)	(125)	(250)	(500)	(1000)	(2000)	(4000)	(8000)
					*******	*******	*******	*******	*******	*******	*******	*******
1	90.00000	3.625269E+06	139.5728	151.9480	71.897	87.394	101.290	115.741	129.222	135.643	135.373	129.723
2	153.40000	1.813772E+05	126.5652	137.7363	65.319	79.717	91.995	104.454	115.802	120.517	121.011	119.734

********* ENDJOB *********

APPENDIX 11

PROGRAM LISTINGS

```
*DECK MAIN
      OVERLAY(SSNOISE,0,0)
      PROGRAM MAIN(INPUT,OUTPUT,TAPE5,TAPE6=OUTPUT,
     *             TAPE1,TAPE2,TAPE3,TAPE4)
      COMMON /IOFILE/ TAPIN,TAPOT
      LOGICAL         TAPIN,TAPOT
      COMMON /CPROGM/ PROGM
      INTEGER         PROGM
      COMMON /TROUBL/ ERR,ENDJOB
      LOGICAL         ERR,ENDJOB
      COMMON /ADAM01/ NAME(6),ADDRES(6),TITLE(6),IDENT(6)
C
      DIMENSION AA(8)
      INTEGER         SSFD
      DATA JETMIX,SSFD,MERGE,NOISE/
     * 6HJETMIX,4HSSFD,5HMERGE,5HNOISE/
C     INITIALIZE--- PRINT CARD INPUT
C
      ERR   = .FALSE.
      ENDJOB= .FALSE.
      WRITE (6,1)
    1 FORMAT(1H1,22X,28H* * C A R D    I N P U T * *//)
      ENDFILE 5
      REWIND 5
    5 FORMAT(1H1)
    6 FORMAT(8A10)
   10 READ (5,6) AA
      IF( EOF,5 ) 15,11
   11 WRITE (6,6) AA
      GO TO 10
C
C     READ ADAM01 BLOCK*** INITIAL PROG. READ
C
   15 REWIND 5
      READ (5,20) NAME
      READ (5,20) ADDRES
      READ (5,20) IDENT
   20 FORMAT(1X,6A10)
   22 TAPOT = .FALSE.
      TAPIN = .FALSE.
      READ (5,25) PROGM,TAPIN,TAPOT
      IF( EOF,5) 1000,30
   25 FORMAT(1X,A10,L1,1X,L1)
   30 WRITE (6,35) PROGM,TAPIN,TAPOT
   35 FORMAT(1H1,10X,16HEXECUTING PROGM=,A6/10X,6HTAPIN=,
     *        L2,5X,6HTAPOT=,L2/)
C
C     SELECT PROGRAM
C
   40 IGO   = 1
      IF( PROGM.EQ.SSFD ) IGO=2
      IF( PROGM.EQ.MERGE ) IGO=3
      IF( PROGM.EQ.NOISE ) IGO=4
   50 GO TO (100,200,300,400 ) , IGO
```

```
C     JETMIX**************
C
  100 IF( TAPIN ) REWIND 1
      IF( .NOT.TAPOT ) GO TO 101
      REWIND 2
      REWIND 3
  101 CALL OVERLAY(7HSSNOISE,1,0,6HRECALL)
      IF( TAPOT ) ENDFILE 2
      IF( ERR ) GO TO 500
      GO TO 22
C
C     SSFD******     (FILE 02 MUST BE PRESENT//TAPIN=T)
C
  200 IF( TAPIN ) REWIND 2
      IF( TAPOT ) REWIND 3
      CALL OVERLAY(7HSSNOISE,2,0,6HRECALL)
      IF( TAPOT ) ENDFILE 3
      IF( ERR ) GO TO 500
      GO TO 22
C
C     MERGE*****     (FILES 02,03 MUST BE PRESENT//TAPIN=T)
C
  300 IF( .NOT.TAPIN ) GO TO 302
      REWIND 2
      REWIND 3
  302 IF( TAPOT ) REWIND 4
      CALL OVERLAY(7HSSNOISE,3,0,6HRECALL)
      IF( TAPOT ) ENDFILE 4
      IF( ERR ) GO TO 500
      GO TO 22
C
C     NOISE*****     (FILE 02 OR 04 MUST BE PRESENT//TAPIN=T)
C
  400 IF( .NOT.TAPIN ) GO TO 402
      REWIND 2
      REWIND 4
  402 CALL OVERLAY(7HSSNOISE,4,0,6HRECALL)
      IF( ERR ) GO TO 500
      GO TO 22
C
  500 WRITE (6,501) PROGM
  501 FORMAT(//2X,9HERR    = T,5X,6HPROGM=,A10//
     * 16X,21H** RUN TERMINATION **)
      GO TO 1002
 1000 WRITE (6,1001)
 1001 FORMAT(/////10X,26H********* ENDJOB *********)
 1002 STOP
      END
```

```
*DECK CBLK
      BLOCK DATA
      COMMON/CHITS/HITS,BLANK
      COMMON/FILK/CSC
      DATA HITS,BLANK/1.E+15,10H          /
      DATA CSC/1000./
      END

*DECK FMPYC
      SUBROUTINE FMPYC(NR,C,X1,Y1,N1,X2,Y2,N2,X3,Y3,N3,
     X  X4,Y4,N4,X5,Y5,N5)
      DIMENSION X1(1),Y1(1),X2(1),Y2(1),X3(1),Y3(1),X4(1),Y4(1),X5(1),
     X  Y5(1)
      DO 300 L=1,NR
      GO TO (205,210,215,220,225), L
  205 NS    = N1
      GO TO 240
  210 NS    = N2
      GO TO 240
  215 NS    = N3
      GO TO 240
  220 NS=N4
      GO TO 240
  225 NS=N5
  240 DO 280 K=1,NS
      GO TO (245,250,255,260,265), L
  245 Y1(K) = C*X1(K)
      GO TO 280
  250 Y2(K) = C*X2(K)
      GO TO 280
  255 Y3(K) = C*X3(K)
      GO TO 280
  260 Y4(K)=C*X4(K)
      GO TO 280
  265 Y5(K)=C*X5(K)
  280 CONTINUE
  300 CONTINUE
      RETURN
      END
```

```
*DECK MOVE
      SUBROUTINE MOVE(NR,X1,Y1,N1,ND1,X2,Y2,N2,ND2,X3,Y3,N3,ND3,
     X  X4,Y4,N4,ND4,X5,Y5,N5,ND5)
CMOVE ---- FORTRAN SIMULATION OF MOVE (CDC)
      DIMENSION X1(1),Y1(1),X2(1),Y2(1),X3(1),Y3(1),X4(1),Y4(1),X5(1),
     X  Y5(1)
      DO 100 L=1,NR
      GO TO (5,10,15,20,25), L
    5 N      = IABS(N1)
      ND     = ND1
      IF( N1.LT.0 ) ND=-1
      NS     = N1
      GO TO 40
   10 N      = IABS(N2)
      ND     = ND2
      IF( N2.LT.0 ) ND=-1
      NS     = N2
      GO TO 40
   15 N      = IABS(N3)
      ND     = ND3
      IF( N3.LT.0 ) ND=-1
      NS     = N3
      GO TO 40
   20 N=IABS(N4)
      ND=ND4
      IF(N4 .LT. 0)  ND=-1
      NS=N4
      GO TO 40
   25 N=IABS(N5)
      ND=ND5
      IF(N5 .LT. 0)  ND=-1
      NS=N5
   40 K      = 1
      IF(NS)401,100,41
  401 K      = N
   41 IF( (K.LE.0) .OR. (K.GT.N) .OR. NS.EQ.0 ) GO TO 100
      GO TO  (45,50,55,60,65), L
   45 Y1(K) = X1(K)
      GO TO 80
   50 Y2(K) = X2(K)
      GO TO 80
   55 Y3(K) = X3(K)
      GO TO 80
   60 Y4(K)=X4(K)
      GO TO 80
   65 Y5(K)=X5(K)
   80 K      = K+ND
      GO TO 41
  100 CONTINUE
      RETURN
      END
```

```
*DECK SETM
      SUBROUTINE SETM(NR,VAL,X1,N1,X2,N2,X3,N3,X4,N4,X5,N5)
      DIMENSION X1(1),X2(1),X3(1),X4(1),X5(1)
      DO 200 L=1,NR
      GO TO  (105,110,115,120,125), L
  105 NS     = N1
      GO TO 140
  110 NS     = N2
      GO TO 140
  115 NS     = N3
      GO TO 140
  120 NS=N4
      GO TO 140
  125 NS=N5
  140 DO 180 K=1,NS
      GO TO (145,150,155,160,165), L
  145 X1(K) = VAL
      GO TO 180
  150 X2(K) = VAL
      GO TO 180
  155 X3(K) = VAL
      GO TO 180
  160 X4(K)=VAL
      GO TO 180
  165 X5(K)=VAL
  180 CONTINUE
  200 CONTINUE
      RETURN
      END
```

```
*DECK TABPRT
      SUBROUTINE TABPRT(NAME, A,NA,NCOL1)
CTABPRT--- CDC VERSION
      DIMENSION A(10)
C     INPUT-
C      NAME  = ARRAY NAME TO BE PRINTED
C      A     = ARRAY TO BE PRINTED
C      NA    = NUMBER OF ELEMENTS
C      NCOL1 = NUMBER OF COLS. TO BE USED IN PRINT FORMAT
C      $$$$$   (MAXIMUM = NA )
C      I1TAB = LOC. OF FIRST ELEMENT IN A TO BE PRINTED
C
      COMMON /CBITS  / IBITS,BLANK
      COMMON /CTABPR/ I1TAB
      EQUIVALENCE      (LSPACE,ASPACE) , (IB,B)
      DIMENSION FMT(12)
      REAL  I12
      INTEGER  HOLL,HTEST
      DATA IBCI/0010000000000/
      DATA (FMT(J),J=1,12)/10H(1X,I5    ,10H          ,10H
     *10H          ,10H          ,10H          ,10H
     *10H          ,10H          ,10H          ,10H
     *10H          )/
      DATA
     * F1,       F3,       F6,       E5,       BCD,      OCT,      I12/
     *6H,F12.1, 6H,F12.3, 6H,F12.6, 6H,E12.4, 6H,6X,A6, 6H,8X,O4, 4H,I12
     */
      DATA HMASK/00000000000000777777777/ , HTEST/00000000000000555555555/,
     *      INMASK/03777777700000000000000/
      DATA NINMSK/07777000000000000000000/

      NCOL  = MIN0(NCOL1,10)
      NB    = NA

C     WRITE  HEADING
      WRITE (6,1000) NAME

   45 I1    = I1TAB
      I     = I1
      I2    = 0

C     WRITE LINE SPACE
   47 WRITE (6,1002)
C     LOCATION OF NEXT LINE SPACE IS GIVEN BY A(I+1)
      ASPACE= A(I+1)
      IF( LSPACE.LE.1 .OR. LSPACE.GE.IBCI ) LSPACE=IBCI
      LSPACE= LSPACE+I-1
      GO TO 110

C     BEGIN LOOP TO DEFINE LINE FORMAT
   48 II    = 1
C
   50 B     = A(I)

C     SPECIAL NUMBERS
      NN    = NINMSK.AND.B
```

```
      IF( NN.EQ.NINMSK ) GO TO 82
C     TEST FOR HOLLERITH (6H------  MAX.)
      HOLL   = HMASK.AND.B
      IF( HOLL.EQ.HTEST ) GO TO 80
C     TEST FOR INTEGER  (BITS 36-58=0 FOR MAX 635 INTEGER
C     FLOATING POINT NUMBERS NORMALIZED
      IF( IB.EQ.IBITS ) GO TO 85
      INTGR = INMASK.AND.IB
      IF( INTGR.EQ.0 ) GO TO 82
C     REAL NUMBER -- NORMALIZED
      B      = ABS(B)
      FMT(II+1)= E5
      IF( B.LT.1.E-3 .OR. B.GE.1.E8 ) GO TO 90
   65 FMT(II+1)= F6
      IF( B.GE.1.E3 ) FMT(II+1)=F3
      IF( B.GE.1.E5 ) FMT(II+1)=F1
      GO TO 90

C     BCD
   80 FMT(II+1)= BCD
      GO TO 90

C     INTEGER
   82 FMT(II+1)= I12
      GO TO 90

C     OCTAL
   85 FMT(II+1)= OCT
   90 II     = II+1
      I      = I+1
      IF( I.GT.LSPACE ) GO TO 100
      IF( II.LE.NCOL .AND. I.LE.NB ) GO TO 50
  100 I2     = I-1
      WRITE (6,FMT) I1,(A(K),K=I1,I2)
      I1     = I
  110 IF( I.GE.NB ) GO TO 990
      IF( I.GT.LSPACE ) GO TO 47
      GO TO 48
  990 I1TAB = 1
 1000 FORMAT(/2X,A6)
 1002 FORMAT(1H )
      RETURN

      END
```

```
*DECK JETMIX
      OVERLAY(SSNOISE,1,0)
      PROGRAM JETMIX
C         MAIN-- JETMIX OVERLAY(1,0)
      COMMON /TROUBL/ ERR,ENDJOB
      LOGICAL         ERR,ENDJOB
      COMMON /CNERR / BITS,CERR,DUM1(3)
      LOGICAL                  CERR
C
C     INPUT OVERLAY
C
    1 CALL OVERLAY(7HSSNOISE,1,1,6HRECALL)
      IF( CERR ) GO TO 10
C
C     CALC./OUTPUT OVERLAY
C
    2 CALL OVERLAY(7HSSNOISE,1,2,6HRECALL)
      IF( .NOT.CERR ) GO TO 20
C
   10 ERR   = .TRUE.
   20 RETURN
      END
```

```
*DECK BLOCKT
      BLOCK DATA
*BLOCKT           BLOCK DATA FOR TURBULENT PARAMETERS
      REAL MUL,MUEFF,KCP,MUREF,MACH
      COMMON /CPROP/ CT(10)
      COMMON /CPROP2/ CTP , CTS , CTM
C*
      COMMON /PROPJT/
     * P         , PRL       , PRT       , RGAS      , SC
     * TREF      , MUREF     , MACH      , XLC       ,
     * REFL      , C         , CHI       , RNORM     ,
     * RHO(200)    , MUL(200)    , KCP(200)    ,
     * MUEFF(200) , XLN(200)    , DK(200)     , RETURB(200)
C*
C*
      DATA
     * C/2.59/   , PRL/.72/   , PRT/1./   , RGAS/53.34/ ,
     * TREF/0./   , MUREF/0./   , SC/216./   ,
     * CHI/.586/ , RNORM/110./
      DATA CT/.23,.38,.23,.05,.38,1.4,.43,.1875,.9,0./
      DATA CTP/.175/ , CTM/.23/ , CTS/.23/
C*
      END




*DECK GAMCP
      SUBROUTINE GAMCP( TT,GAM,CP,RGAS,J1,J2)
CGAMCP          COMPUTE GAMMA, CP----    (P.H. HECK)
      DIMENSION TT(1),GAM(1),CP(1)
C*
C*  VALID TEMPERATURE RANGE=     T.LT.3600
C*
    1 ROJ=RGAS/778.
      DO 10 L=J1,J2
      T=TT(L)
      IF(T.LE.800.) GO TO 50
      IF(T.GE.3600.) GO TO 40
C*
      GAM(L)=2.23708/T**.070271
      GO TO 10
C*
   50 GAM(L)=1.4
      GO TO  10
C*
   40 GAM(L)=1.254
C*
   10 CP(L)=GAM(L)*ROJ/(GAM(L)-1.)
      RETURN
      END
```

```
*DECK GAMH
      FUNCTION GAMH(T)
CGAMH          FUNCTION  GAMH  (T)--P.H. HECK
      IF(T.LE. 800.) GO TO 10
      IF(T.GE. 3600.) GO TO 12
C*
      GAMH=2.23708/T**.070271
      GO TO 15
   10 GAMH=1.4
      GO TO 15
   12 GAMH=1.254
   15 RETURN
      END
```

```
*DECK INTEG
      SUBROUTINE INTG(Y,X,YDXI,IL,IU)
CINTG            INTEGRAL OF Y*DX--TRAPEZOIDAL/UNEQUAL X S
      DIMENSION Y(1),X(1),YDXI(1)
C*
C*  EVALUATE INTEGRAL--- Y*DX  ***TRAPEZOIDAL RULE
C*       *******UNEQUAL SPACING
C*
    1 I=IL-1
    2 I=I+1
      DX=X(I)-X(I-1)
      TERM=.5*(Y(I)+Y(I-1))
    3 YDXI(I)=YDXI(I-1)+TERM*DX
      IF(I.LT. IU) GO TO 2
   10 RETURN
      END
```

```
*DECK JETPRP
      SUBROUTINE JETPRP
CJETPRP           PROPERTIES OF JET
      LOGICAL SUPERT
      LOGICAL ENTRY1
      LOGICAL  AXI , XPRN , CMPRS , QJET , TURBJ , CORE
      LOGICAL SUBSON,TMACH
      LOGICAL ERR
      LOGICAL AMBTO
      REAL  MJET , ME , MUREF
      REAL MACH
      REAL KCP,MUEFF,MUL
      COMMON /JETTWO/
     * TWO     , DIAO    , MJETO   , TJETO   , VJETO   ,
     * PTJETO , TIJETO  , NJO
      REAL  MJETO,MACHO
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI     , MERGE   , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI   , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
      COMMON /PROPJ2/ MACHO,REFLO,YI,YO,MERGP
      LOGICAL MERGP
      COMMON /RATIO/    AMBTO
      COMMON /INP1/ ENTRY1
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ         , MJET         , TJET         , PTJET        , VJET
     * TIJET        ,
     * PE           , VE           , ME           , TIE          , TE
     * AXI          , NJ           , NM           ,
     * X(100)       , XPRN(100)    ,
     * GAM          , RG           , PR           , RRT
     * SC           , TREF         , MUREF
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA         , CMPRS        , QJET         , TURBJ        , COEF(10)
     * NPU  ,   NPD   , DXC    , XU    , XDD   ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ FSI(200),YD(200),UD(200),THD(200),ED(200)
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
```

```
C****** POTENTIAL CORE COMMON
C*
      COMMON /CORED/ XCORE  , CORE  , CORSIP
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP  , SV  , SLEN
C*
C****** JET PROPERTIES COMMON
C*
      COMMON /JET/
     * B(100)    , UC(100)   , TC(100)    , TIC(100) ,
     * PTC(100) , WJ(100)   , YJ(100)    ,
     * YSONIC(100)
      COMMON /JET1/ FLOWJ,TTO,NX,EJET
      COMMON /JET2/  TTC(100)
      COMMON /PROPJT/
     * P        , PRL       , PRTT       , RGAS      , SCC
     * TREFF    , VSREF     , MACH       , XLC       ,
     * REFL     , C         , CHI        , RNORM     ,
     * RHO(200)    , MUL(200)    , KCP(200)    ,
     * MUEFF(200) , XLN(200)    , DK(200)     , RETURB(200)
      COMMON /EDGE/  YJETE  ,  SFEDGE
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                 P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /THRST/WV(100)
      COMMON /MIXPRP/ MA2(100),VE2(100),TE2(100),TWC(100)
      REAL MA2
      COMMON /THERM/ GMC(200),CP(200)
      COMMON /OUTMIX/ NXORIG
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /JET3/ STADD, NV, STATF
      COMMON /INNAME/ NB, TAB(5) , ND , TAD(4)
      COMMON /CONSTF/ CON1
      COMMON /YOFXI / IE
      LOGICAL  STADD,STATF
      DIMENSION T(200), STOR1(200)
      DIMENSION Y(200)
      DIMENSION TKE(200),STOR2(200)
      EQUIVALENCE (TKE(1),DSTOR(601)),(STOR2(1),DSTOR(601))
      DIMENSION YMACH(200)
      EQUIVALENCE (YMACH(1),DSTOR(601))
      EQUIVALENCE (Y(1),DSTOR(401))
      EQUIVALENCE (T(1),DSTOR(1)), (STOR1(1), DSTOR(201))
      EQUIVALENCE (CN,COEF(6))
```

```
      EQUIVALENCE (ITWO,TWO)
      DATA NREG/1/
C*    PROPERTIES DIMENSIONLESS UNLESS OTHERWISE NOTED
C*
    1 IF(.NOT.ENTRY1) GO TO 10
      ITWOJ = 1
      IF( TWO ) ITWOJ=2
      NX=1
      NV=1
      DT0=TJET-TE
      XJ=X(1)
      IGO=1
C*    INITIALIZE AT 1-ST STATION
C*
    2 UC(1)=UD(1)
      TC(1)=THD(1)
      TIC(1)=TIJET
      PTC(1)=1.
      TTC(1)=1.
      IF(AMBTO) TTC(1)=BITS
      IF(MJET.EQ. 0.) PTC(1)=BITS
      YJ(1)=YD(NPD)
C*    EVALUATE MASS FLOW IN JET--STREAM FUNCTION
C*
    3 EXP=1.
      IF(AXI) EXP=2.
      CON1=VJET*C6**EXP
      REFL=B(1)*C6
   99 CALL FMPYC(1,C6,YD,Y,NPD)
      CALL FMPYC(1,EJET,ED,TKE,NPD)
      CALL FMPYC(1,TJET,THD,T,NPD)
      CALL SCALE(UD,ITWOJ,1,X(1))
      CALL PROPJ(ITWOJ,TURBJ,1,XJ,Y,T,TKE,1,NPD)
      CALL GAMCP(T,GMC,CP,RG,1,NPD)
      DO 5 L=1,NPD
      RAD=1.
      IF(AXI) RAD=YD(L)
    5 STOR1(L)=.5*RHO(L)*UD(L)*RAD
    6 PSI(1)=0.
   66 CALL INTG(STOR1,YD,PSI,2,NPD)
C*
C*    IF MIXER NOZZLE CASE,  COMPUTE STREAM
C*    FUNCTION COINCIDENT WITH DUCT WALL
C*
      IF(.NOT. MIX) GO TO 666
      YO=YR(1)
      YI=YD(NPD)
      RHOE=TJET*RHO(1)/TE
      DPSIE=.5*RHOE*VE/(EXP*VJET)*(YO**EXP-YI**EXP)
      PSID=PSI(NPD)+DPSIE
      PD(1)=PE
      MA2(1)=ME
      VE2(1)=VE
      TE2(1)=TE
      YCD(1)=BITS
      TWC(1)=BITS
```

```
  666 WJ(1)=1.
      FLOWJ=PSI(NPU)*CON1
      CPJ=GAM*RG/(GAM-1.)*GC/GCJ
      SUBSON=.TRUE.
      IF(ME.GE. 1.  .OR.  MJET .GE. 1.)  SUBSON=.FALSE.
      GO TO 8760
C*
C*  ENTRIES AT STATIONS OTHER THAN STATION 1
C*
   10 UC(NX)=UD(1)
      TC(NX)=THD(1)
      TIC(NX)=SQRT(2.*EJET*GCJ*ED(1)/3.)/VJET
C*
   11 YJ(NX)=YJETE
      YSET=YJETE
      IF(TWO) YSET=EDGEI
      IF( NREG.NE.2 ) NREG=1
      IF(UD(2).NE.UD(3))    NREG=2
      GO TO (12,14),NREG
C*
C*  POTENTIAL CORE REGION
C*
   12 DO 13 L=1,NPD
      IF(UD(L).NE.UCL1)  GO TO 15
   13 CONTINUE
   15 B(NX)=YSET-YD(L-1)
      GO TO 20
   14 B(NX)=2.*YJETE
C*
C*  CL TOTAL PRESSURE
C*
C*
   20 IF(.NOT. CMPRS) GO TO 22
      TEMP=THD(1)*TJET
      VJC=VJET*UD(1)
      GAM=GMC(1)
      CPJ=CP(1)
      GAM=GAMH(TL)
      TTCL=TEMP+.5*VJC*VJC/(GCJ*CPJ)+EJET*ED(1)/CPJ
      IF(.NOT.  AMBTO) GO TO 1337
      TTC(NX)=BITS
      GO TO 1338
 1337 TTC(NX)=(TTCL-TE)/(TTO-TE)
 1338 CONTINUE
      XMJ=VJC/SQRT(GAM*GC*RG*TEMP)
      TTRJ=TTCL/TEMP
      PK=PE
      IF(MIX) PK=P2
      POC=PK*(1.+.5*(GAM-1.)*XMJ**2)**(GAM/(GAM-1.))
      PTC(NX)=(POC-PE)/(PTJET-PE)
C*
C*  LOCATE SONIC LINE IF SUPERSONIC***
C*
 8760 IF(SUBSON)    GO TO 29
      TMACH=.FALSE.
      SUPERT=.TRUE.
```

```
      LK=2
      IE    = 1
      DO 211 L=1,NPD
      IF(L.GT. 1  .AND.  UD(L).EQ. UCL1)  LK=L
      TL=THD(L)*TJET
      GAM=GAMH(TL)
      VSON=SQRT(GAM*GC*RG*TL)
      YMACH(L)=UD(L)*VJET/VSON
      IF(L.LT.NPD .AND. YMACH(L).EQ. YMACH(L-1))  LK=L
      IF(.NOT. SUPERT)  GO TO 217
      SUPERT= YMACH(L).LT. 1.
  217 IF(TMACH)  GO TO 211
      TMACH=YMACH(L).GE.1.
  211 CONTINUE
      IF(SUPERT)  GO TO 29
      IF(.NOT. TMACH) SUBSON=.TRUE.
  212 IF(.NOT. SUBSON) GO TO 213
      YSONIC(NX)=0.
      GO TO 30
  213 YSONIC(NX)=YOF(1.,YMACH,YD,LK,NPD-1)
      IF(.NOT. ERR) GO TO 30
      ERR=.FALSE.
   29 YSONIC(NX)=BITS
      GO TO 30
   22 PTC(NX)=BITS
      TTC(NX)=BITS
C*
C*
C*  EVALUATE MASS FLOW IN JET
C*
   30 IF(NX.EQ.1) GO TO 1000
      WJ(NX)=SFEDGE/FLOWJ*CON1
C*
C*
C*   STORE PARAMETERS FOR CONFINED JET
C*
 1000 IF(.NOT. MIX) GO TO 1001
      IF(STADD) GO TO 1001
      IF(NX .EQ. 1) GO TO 946
      YCD(NV)=YDC
      PD(NV)=P2
      IF(.NOT. SUBSON)  INDC(NV)=1
      IF(CHOKE) INDC(NV)=2
      MA2(NV)=MACH2
      VE2(NV)=V2
      TE2(NV)=TS2
C*
C*  IF MIXER NOZZLE CASE,  CALCULATE THRUST
C*
  946 CALL  THRUST(NV)
C*
C*  IF FLOW CHOKED, CHECK AVAILABLE AREA AT NEXT STATION.
C*  IF  .LE. CURRENT AREA TERMINATE
C*
      IF(.NOT. CHOKE)  GO TO 1001
      A1=YDD**EXP-YCD1**EXP
```

```
      IF(NV.EQ. NXORIG)  GO TO 1001
      NV1=NV+1
      XNX=XD(NV1)
      CALL LCFIT(XD,YR,NXORIG,0,XNX,YDNX,1,0,CLSP)
      CALL LCFIT(XD,YCB,NXORIG,0,XNX,YCBNX,1,0,CLSPCB)
      A2=YDNX**EXP-YCBNX**EXP
      IF(A2.LE. A1)  STATF=.TRUE.
 1001 RETURN
      END
```

```
*DECK JTFILE
      SUBROUTINE JTFILE (NTRY,XX)
CJTFILE         STORAGE OF AERO-DATA FILE FOR PLOT OR NOISE
      LOGICAL  ENTRYI
      LOGICAL FOUND
      LOGICAL MCHANG
      LOGICAL AMBTO
      LOGICAL DPRIN
      LOGICAL  EOF  ,  ERR
      LOGICAL  AXI , XPRN , CMPRS , QJET , TURBJ , CORE
      LOGICAL ENTRY1
      REAL  MJET , ME , MUREF
      REAL MACH
      REAL  MOLF1(200),MOLF2(200),MOLF3(200),MOLF4(200),MOLF5(200),
     *      MOLF6(200)
      COMMON /RSTART/ NREG,RESTRT,NRES,MIXPRE
      LOGICAL  MIXPRE
      COMMON /CTRL2/ TWODT(9)
      COMMON /DIFEQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /DICTRL/ DIFF , CND(10)
      LOGICAL          DIFF
      COMMON /MOLES/ ALX(200,6)
      COMMON /BCMOL/ ALEDGE(6),  ALO(6)
      COMMON /FILES/ ORGF,UPDF,NEWF,SCRF
      COMMON /FILK/  CSC
      COMMON /PARAM/
     * U(200),T(200),TOT(200),XMACH(200),PTOT(200),TTD(200),
     * PTD(200),DUMP9(409)
      COMMON /RATIO/   AMBTO
      COMMON /MISC/ PM(10),  PLOT
      COMMON /INP1/ ENTRY1
      COMMON /UMESH/ MCHANG,CK,DY1,NMSH       , CXPC,CXTP,NRED
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ        , MJET        , TJET        , PTJET       , VJET        ,
     * TIJET       ,
     * PE          , VE          , ME          , TIE         , TE          ,
     * AXI         , NJ          , NM          ,
     * X(100)      , XPRN(100)   ,
     * GAM         , RG          , PR          , PRT         ,
     * SC          , TREF        , MUREF
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
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```
      COMMON /CORED/ XCORE   , CORE   , CORSTP
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP   , SV   , SLEN
C*
      COMMON /JET1/ FLOWJ,TTO,NX,EJET
      COMMON /PROPJT/
     * P         , PRL       , PRTT      , RGAS      , SCC       ,
     * TREF      , VSREF     , MACH      , XLC       ,
     * REFL,C,CHI,RNORM,
     * RHO(200),DUM13(600),XLN(200),DUM14(400)
      COMMON /XPRIN/ DPHIN
      COMMON /FDATA/  DUM7(4),NFCSV,NRW
      COMMON /CPROP/ CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8  ,CT9,CT10
      COMMON/ PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
      COMMON /JET/
     * B(100),UC(100),TC(100),TIC(100),
     * PTC(100),WJ(100),YJ(100),YSONIC(100)
      COMMON /JET2/ TTC(100)
      COMMON /CTRL/
     * NXTA         , CMPRS        , QJET         , TURBJ        , COEF(10)     ,
     * NPU   ,   NPD   , DXC   , XU   , XDD   ,
     * TID(200)     , DSTOR(600)
      COMMON /TAG/
     * NAME(10),TITLE(10),IDENT(10),ADDRES(10),IDENT1(10)
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /MIXPRP/ MA2(100),VE2(100),TE2(100),TWC(100)
      REAL MA2
      COMMON /THRST/ WV(100)
      COMMON /OUTMIX/ NXORIG
      COMMON /CHODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /JET3/STADD,NV,STATF
      COMMON /KEYS/ KEY(11),KEYB(11),KODA(11),KODB(11)
      COMMON /MERGET/ MER,MERSTP,XMRG
      COMMON /SUPER/ SUPC,SUPSTP,XSUP
      COMMON /CPROP2/ CTP,CTS,CTM
      COMMON /PROPJ2/ MACHO,REFLO,YI,YO,MERGE
      COMMON /CONSTF/ CON1
      COMMON /FILINO/ KREC,KXX
C*
      EQUIVALENCE (MOLF1(1),ALX(1))     , (MOLF2(1),ALX(201))   ,
     *            (MOLF3(1),ALX(401))   , (MOLF4(1),ALX(601))   ,
     *            (MOLF5(1),ALX(801))   , (MOLF6(1),ALX(1001))
```

```
C*
      DIMENSION  LEN2(11),NS2A(10),LEN1(5),NSA(4)
      EQUIVALENCE  (UE,VE)
      EQUIVALENCE (C6,COEF(6))
      DATA  ENTRYI/T/
      DATA NSA/15,1HJ,6,1HJ/
      DATA NS2A/5,2HII,1,2HIL,11,1HI,10,2HIJ,5,2HJK/
      DATA IBLANK/0202020202020/
      DATA IPROF/5HAPROF/
      DATA KXX1/2HXX/
C*
C*
C*    NTRY=1      WRITE PROFILES AT STATION XX
C*    NTRY=2   WRITE CL PROPS. AND INPUT VARIABLES
C*     NTRY=3   READ CL PROPS AND INPUT VARIABLES
C*    NTRY=4   RECLAIM PROFILE AT STATION XX
C*
    1 GO TO  (10,100,120,200) , NTRY
C*
   10 IF(.NOT.ENTRYI)  GO TO 11
      CALL EMPYC(1,VJET,UD,U,NPD)
      CALL EMPYC(1,TJET,THD,T,NPD)
      KREC  = 0
   11 ENTRYI=.FALSE.
      KREC  = KREC+1
      KXX   = CSC*XX+.5
      WRITE (3) KREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,FD,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,J
      GO TO 1000

  100 REWIND 3
      WRITE (2) KXX1,KREC,
     * NAME,TITLE,IDENT,ADDRES,IDENT1,
     * TWODT  ,
     * BITS,ERR,GC,GCJ,FOOT,
     * DIAJ,MJET,TJET,PTJET,VJET,TIJET,EJET,
     * PE,VE,ME,TIE,TE,AX1,NJ,NM,
     * UE,MIXPRE,XLC,FLOWJ,MERGE,NV,CON1,
     * CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CTP,CTS,CTM,
     * GAM,RG,PR,PRT,SC,TREF,MUREF,SP,SV,SLEN,DPRIN,PLOT,
     *C6,MIX,CF,MAXIT,TOL,SUPB ,
     *X,XPEN,B,UC,TC,TIC,PTC,WJ,YJ,TTC,
     * YSONIC  ,
     *YCB,XD,RD,YR,YCD,PD,WV,MA2,VE2,TE2,NXTA,I,
     *NC,CNAME,ALJ,ALJO,ALE,SCM,DIFF
      DO 101 IJ=1,KREC
      READ (3) JREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,FD,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,J
      WRITE (2) JREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,ED,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,J
  101 CONTINUE
      GO TO 1000
```

```
120 READ (1) KXX1,KREC,
     * NAME,TITLE,IDENT,ADDRES,IDENT1,
     * TWODT   ,
     * BITS,ERR,GC,GCJ,FOOT,
     * DIAJ,MJET,TJET,PTJET,VJET,TIJET,FJET,
     * PE,VE,ME,TIE,TE,AXI,NJ,NM,
     * UE,MIXPRE,XLC,FLOWJ,MERGE,NV,CON1,
     * CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CTP,CTS,CTM,
     * GAM,RG,PR,PRT,SC,TREF,MUREF,SP,SV,SLEN,DPRIN,PLOT,
     *C6,MIX,CF,MAXIT,TOL,SUPB  ,
     *X,XPRN,B,UC,TC,TIC,PTC,WJ,YJ,TTC,
     * YSONIC   ,
     *YCR,XD,RD,YR,YCD,PD,WV,MA2,VE2,TE2,NXTA,I,
     *NC,CNAME,ALJ,ALJO,ALE,SCM,DIFF
      GO TO 1000

200 KRES   = CSC*XX+.5
      DO 210 IJ=1,KREC
      READ (1) JREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,ED,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,J
      IF( KXX.EQ.KRES ) GO TO 220
210 CONTINUE
      ERR    = .TRUE.
      WRITE (6,211) XX
211 FORMAT(1H1,//2X,10HSTATION X=,F10.6,2X,11HNOT ON FILE//)
      GO TO 1000
220 WRITE (6,221) XX
221 FORMAT (1H1,///2X,20H**JETMIX RESTART  X=,F10.6//)
      IF(MIX)  MIXPRE=.TRUE.

1000 RETURN
      END
```

```
*DECK LCFIT
      SUBROUTINE  LCFIT(X,Y,NPTS, NEW, XC,YC,NXC,ND, C)
CLCFIT           INTEGRATE OR INTERPOLATE                         "LCFIT"

C     INTEGRATE OR INTERPOLATE USING A PARABOLA WH9CH PASSED THROUGH THE ITH
C     AND (I+1) POINTS BUT MISSES THE (I-1) AND (I+2) POINTS (IF THEY BOTH
C     EXIST) SUCH THAT THE SQUARE OF THE DEVIATION IS A MINIMUM.  NOTE
C     THAT  I  IS GENERALLY SELECTED SUCH THAT
C                X(I).LE.XC.LT.X(I+1)
C     THE EQUATION FOR THE PARABOLA IS
C                Y-Y(I) = B*(X-X(I)) + C*(X-X(I))**2

      DIMENSION X(10),Y(10), XC(10),YC(10), C(10)
      LOGICAL NEW

C    INPUT-
C     X, Y     PTS. ON CURVE
C     NPTS     NO. OF X
C     NEW    = .FALSE. IF THE "C" ARRAY OF COEFFICIENTS IS
C              AVAILABLE FROM A PREVIOUS ENTRY
C     XC       LIST OF X AT WHICH CALC TO BE DONE
C     YC(1)    INTEGRATION CONSTANT IF  ND=-1
C     NXC      NO. OF XC
C     ND       =0 TO GET COORD,  =1 TO GET 1ST DERIVATIVE,
C              =-1 FOR INTEGRATION

C    OUTPUT
C     YC         COORDINATE OR DERIVATIVE AT XC     OR
C                YC(IC)= INTEGRAL(Y*DX) FROM XC(1) TO XC(IC) WHERE IC=2,NXC
C     C      = ARRAY OF (NPTS-1) COEFFICIENTS

C    NOTES-
C     FOR INTEGRATION "XC" MUST BE IN THE SAME ORDER AS "X".  FOR INTERPOLATION
C     "X" MAY BE IN EITHER ASCENDING OR DESCENDING ORDER.
C        NO SPECIAL ORDER IS REQUIRED

      COMMON /CLSPF / I

      LOGICAL WITHIN
      DATA BITS/1.E+15/
      IF(.NOT.NEW) GO TO 90
      N      = NPTS-1

C     EVALUATE COEFFICIENT  C(I)

      DO 30 I=1,N
      XI     = X(I)
      YI     = Y(I)
      X3     = X(I+1)-XI
      BOT    = 0.
      TOP    = 0.
      C(I)   = 0.
      Y3     = Y(I+1)-YI
      IF(I.LE. 1  .OR.  Y(I-1).EQ.BITS) GO TO 27
      X1     = X(I-1)-XI
      X13    = X(I-1)-X(I+1)
```

```
      TOP    = X1*(Y3*X1-(Y(I-1)-YI)*X3)*X13
      BOT    = X1*X1*X13*X13*X3
   27 IF(I.GE.N  .OR.  Y(I+2).EQ.BITS)  GO TO 28
  271 X4     = X(I+2)-XI
      X43    = X(I+2)-X(I+1)
      TOP    = TOP + X4*(Y3*X4-(Y(I+2)-YI)*X3)*X43
      BOT    = BOT + X4*X4*X43*X43*X3
   28 IF(BOT.NE.0.) C(I)=-TOP/BOT
   30 CONTINUE
C
C     BEGIN INTERPOLATION LOOP FOR XC(IC)  IC=1,NXC
   90 I      = MAX0(1,MIN0(I,N))
      IF(ND.EQ.(-1)) I=1
      SGN    = SIGN(1.,X(N+1)-X(1))
      IC     = 1
      GO TO 160
C
C     LOCATE APPROPRIATE INTERVAL
  100 WITHIN= .FALSE.
      NCOUNT= N
  102 IF(NCOUNT) 119,103,103
  103 NCOUNT= NCOUNT-1

      XI     = X(I)
      XD     = XC(IC)-XI
      IF(N) 104,120,104
  104 IF(SGN*XD) 105,107,110
C
C      F.LT.0. (F IS THE FRACTIONAL POSITION IN THE INTERVAL)
  105 IF(I.EQ.1)        GO TO 120
      IF(ND.EQ.(-1)) GO TO 119
      I      = I-1
      GO TO 102
C
C      F.EQ.0
  107 IF(X(I+1).NE.XI) GO TO 120
      GO TO 116
C
C      F.GT.0.
  110 IF(SGN*(XC(IC)-X(I+1))) 120,112,114
C
C      F.EQ.1.0,  CHECK FOR INTEGRATION AND DOUBLE POINT BEFORE INCREMENTING
  112 IF((ND.EQ.(-1)) .OR. (I.NE.N  .AND.  X(I+1).EQ.X(I+2))) GO TO 120
C      F.GT.1.0
  114 IF(I.EQ.N) GO TO 120
      IF(ND.EQ.(-1)) GO TO 125
  116 I      = I+1
      GO TO 102
C
  119 GO TO 900
C
C     PRELIMINARY CALCULATIONS FOR INTERPOLATION OR INTEGRATION
  120 WITHIN=.TRUE.
  125 X3     = X(I+1)-X(I)
      YI     = Y(I)
      B      = 0.
```

```
      CI     = C(I)
      IF(N.GT.0 .AND. X3.NE.0.)  B = (Y(I+1)-YI)/X3 - CI*X3
  129 IF(ND) 130,140,141

C     ND=-1, INTEGRATE
  130 IF(.NOT.WITHIN) XD=X3
      S1     = (YI + (B/2. + CI/3.*XD)*XD)*XD
      IF(WITHIN) GO TO 135
C     "I" IS BEING INCREMENTED TO FIND APPROPR9ATE INTERVAL.  HENCE,
C      CUMULATE THE INTEGRAL OF THE ITH INTERVAL.
      SA     = SA + S1
      GO TO 116
C     APPROPRIATE INTERVAL FOUND.    X(I)-XC(IC)-X(I+1)
  135 IF(IC.EQ.1) SA=YC(IC)-S1
      IF(IC.NE.1) YC(IC)=SA+S1
      GO TO 150

C     ND=0,  INTERPOLATE FOR COORDINATES
  140 YC(IC)= YI + (B + CI*XD)*XD
      GO TO 150

C     ND=1,  FIRST DERIVATIVE
  141 YC(IC)= B + 2.*CI*XD
      GO TO 150

  150 IC     = IC+1
  160 IF(NXC-IC) 900,100,100

  900 RETURN
      END
```

```
*DECK PROPJ
      SUBROUTINE PROPJ(TWO,NTURB,NREG,X,Y,T,TKE,J1,J2)
CPROPJ PROPERTIES OF A LAMINAR OR TURBULENT JET
      COMMON /XPRIN/ DPRIN
      LOGICAL DPRIN
      INTEGER TWO
      LOGICAL NTURB
      REAL MACH,MUL,MUEFF,KCP,MUREF
C*
C*
C*  TWO =1 SINGLE JET
C*  TWO =2 COANNULAR/COPLANAR JET
C*
C*  NTURB=F LAMINAR PROPERTIES ONLY
C*       =T LAMINAR AND TURBULENT PROPERTIES
C*  NREG =1 MIXING REGION (X.LT.XLC)
C*  NREG =2 TRANSITION REGION (X.GE.XLC)
C*  NREG =3 (LARGE X------- SIMILAR PROFILES)
C*  X   = AXIAL CO-ORDINATE (X/DJET)
C*  Y   = NORMAL CO-ORDINATE,FT.
C*  T   = TEMPERATURE , DEG R
C*  TKE = TURBULENT KE, BTU/LBM
C*
C*  XLC = AXIAL CO-ORDINATE--START OF TRANSITION REGION
C*  MACH = JET DISCHARGE MACH NUMBER
C*
C*
      COMMON/PROPJT/
     * P , PRL , PRT , RGAS , SC ,
     * TREF , MUREF , MACH , XLC ,
     * REFL , C , CHI , RNORM ,
     * RHO(200) , MUL(200) , KCP(200) ,
     * MUEFF(200) , XLN(200) , DK(200) , RETURB(200)
      COMMON/CPROP/CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CT10
      COMMON /CPROP2/ CTP, CTS , CTM
      COMMON /PROPJ2/ MACHO,REFLO,YI,YO,MERGE
      LOGICAL MERGE
      REAL MACHO
      COMMON /MISC/ PM(10), DUM33
      LOGICAL LTERP
      COMMON /LLTERP/ LTERP
      COMMON /CTRL/ DUMCL1(9), C6 , DUMCL2(809)
      COMMON /EDGE  / YJETE,SFEDGE
      COMMON /SCALE1/ SCALEC
      LOGICAL         SCALEC
C*
      DIMENSION Y(1), T(1), TKE(1)
      DATA GCJ/25039.7372/
C*
C*  MUL =LAMINAR VISCOSITY,LBM/FT-SEC
C*  MUEFF =EFFECTIVE VISCOSITY,LBM/FT-SEC
C*  RETURB=TURBULENCE REYNOLDS NUMBER
C*  KCP =KEFF/CP,LBM/FT-SEC
C*  XLN =TURBULENCE LENGTH SCALE,FT
C*  RHO =DENSITY,LBM/FT3
C*  DK =DIFFUSION PARAMETER FOR TURBULENCE
```

```
C*   PR =LAMINAR PRANDTL NUMBER
C*   P   =PRESSURE,PSI
C*   SC  =SUTHERLAND CONSTANT,DEG R
C*   TREF = REFERENCE TEMPERATURE,DEG R
C*   MUREF = REFERENCE VISCOSITY,LBM/FT-SEC
C*
C*   RNORM =NORMALIZING TURBULENCE REYNOLDS NUMBER
C*   REFL =REFERENCE DIMENSION FOR TURB. LENGTH SCALE,FT
C*   PRT TURBULENT PRANDTL NUMBER
C*
C*
C*   CONSTANT VALUES
C*
      OPR=1./PRL
      OPRT=1./PRT
      CPRESS=144.*P/RGAS
      IF(NTURB) OREFL=1./REFL
      ORNORM=1./RNORM
      IF(TREF.NE.0.) OTREF=1./TREF
      CKEL=1./1.8
      CM=1./(1.+CT5*MACH)
      GO TO (300,310) , TWO
  310 CMO=1./(1.+CT5*MACHO)
      CT10=2.*CT9-1.
  300 IF(NREG.NE.2) GO TO 33
      XRAT=X/XLC
      CN=CT4*(CT6+CT7*MACH)
      TRANS=XRAT**CN
      IF(.NOT.LTERP) GO TO 3
      CM=1.0/(1.0+CT2*MACH)
      TESTL=CT8*(XRAT-1.)+CT1*CM*(2.-XRAT)
      IF(XRAT  .GE. 2.)  NREG=3
      GO TO 4
    3 CONTINUE
      TESTL=CT3*CM*TRANS
      IF(TESTL .GE. CT8) NREG=3

C**    MODIFICATIONS FOR SCALE CHANGE IN CORE REGION

   33 YC     = YJETE-REFL/C6
      YINLIM= .9*YC
      YOULIM= YC+.1*REFL/C6
C*
    4 DO 100 J=J1,J2
      TT=T(J)
      RHO(J)=CPRESS/TT
      VISR=0.
      IF(TREF.NE.0.) GO TO 5
C*
C*   VISCOSITY OF AIR
C*
      MUL(J)=.98242E-6*SQRT(CKEL*TT)/(1.+201.6/TT)
      GO TO 10
C*
C*   LAMINAR VISCOSITY---GENERAL
C*
```

```
    5 TR=TT*OTREF
      MUL(J)=MUREF*TR*SQRT(TR)*(TREF+SC)/(TT+SC)
   10 IF(.NOT. NTURB) GO TO 80
C*
C*  CALCULATION OF TURBULENT PARAMETERS
C*
      YT=Y(J)
C*
C*  TURBULENCE SCALE CALCULATION-- CHECK FOR TYPE OF JET
C*
C*
C******* COMPUTATION OF LENGTH SCALE FOR TURBULENCE ******
C*
      GO TO (20,400) , TWO
   20 GO TO (25,35,40),NREG
C*
C*  MIXING LAYER--REFL=WIDTH OF MIXING ZONE
C*
   25 IF( SCALEC ) GO TO 27
      CSCALE= REFL
      GO TO 28
   27 IF( YT.LT.YINLIM ) CSCALE=C6
      IF( YT.GE.YOULIM ) CSCALE=REFL
      IF((YT.GE.YINLIM) .AND. (YT.LT.YOULIM)) CSCALE=C6-(C6-REFL)*
     * (YT-YINLIM)/(YOULIM-.9*YC)
   28 XLN(J)= CT1*CM*CSCALE
      GO TO 50
C*
C*  TRANSITION REGION
C*
   35 XLN(J)=TESTL*REFL
      GO TO 50
C*
C*  SPALDING-- SEQUENCE FOR LENGTH SCALE
C*
   40 XLN(J)=CT8*REFL
      GO TO 50
C*
C*  COANNULAR/COPLANAR JET--SET LUS INDICATOR FOR UP/DN-STREAM
C*  OF MERGE POINT
C*
  400 LUS=1
      IF(MERGE) LUS=2
      IF(J.GT. 1) GO TO 410
C*
C*  COMPUTE TERMS WHICH REMAIN CONSTANT AT A GIVEN STATION
C*
      SCLI=CT1*REFL*CM
      SCLO=CTS*REFLO*CMO
      DSCL=SCLO-SCLI
      CYIR=CT9*(YI+REFLO)
      DENMU=YO-CYIR
  410 GO TO (420,460) , LUS
C*
C*  UPSTREAM OF MERGE STATION
C*
```

```
  420 YLIMI=CT9*YI
      YLIMO=YO-CT9*REFLO
      IF(YT.GT.YLIMI .AND. YT.LT.YLIMO) GO TO 425
      IF(YT.LE.YLIMI) XLN(J)=SCLI
      IF(YT.GE.YLIMO) XLN(J)=SCLO
      GO TO 50
C*
  425 XLN(J)=SCLI+DSCL*(YT-CT9*YI)/DENMU
      GO TO 50
C*
C*  DOWNSTREAM OF MERGE STATION
C*
  460 IF(J.GT.1) GO TO 3944
      IF(REFLO.GT.YO) REFLO=YO
      IF(YI.GT.YO) YI=YO
      YLIMI=CT9*(YO-REFLO)
      YLIMO=YO-CT9*(YO-YI)
      YOMR=CT9*(YO-REFLO)
      DENMD=CT9*(YI+REFLO)-CT10*YO
      IF(NREG.EQ.1) SCLI=SCLI*CTP/CT1
      IF(NREG.GT.1) SCLI=SCLI*CTM/CT1
      DSCL=SCLO-SCLI
 3944 IF(YT.GT.YLIMI .AND. YT.LT.YLIMO) GO TO 465
      IF(YT.LE.YLIMI) XLN(J)=SCLI
      IF(YT.GE.YLIMO) XLN(J)=SCLO
      GO TO 50
  465 XLN(J)=SCLI+DSCL*(YT-YOMR)/DENMD
C*
C*  COMPUTE TURBULENCE REYNOLDS NUMBER
C*
   50 RETURB(J)=RHO(J)*SQRT(GCJ*TKE(J))*XLN(J)/MUL(J)
C*
C*  CALCULATE EFFECTIVE VISCOSITY
C*
      CKI=1.
      KGO=1
      GO TO 51
  511 CKI=CHI
   51 ZETA=CKI*RETURB(J)*ORNORM
      H=1.
   60 GO TO (61,70),KGO
   61 VISR=0.2*H*RETURB(J)
      MUEFF(J)=MUL(J)*(1.+VISR)
      KGO=2
      GO TO 511
C*
C*  EVALUATE DIFFUSION PARAMETER
C*
   70 DK(J)=1.+.2*CHI*H*RETURB(J)
C*
C*  EVALUATE KEFF/CP----
C*
   80 KCP(J)=MUL(J)*(OPR+VISR*OPRT)
C*
  100 CONTINUE
      IF(PM(9).EQ.0.) GO TO 2
```

```
      IF(X.GE.PM(8) .AND. X.LE. PM(9)) WRITE (6,1630) X,YO,YI,REFL,
     * REFLO,SCLI,SCLO,YLIMI,YLIMO
 1630 FORMAT(/2X,9E14.7)
  200 IF(.NOT. DPRIN) GO TO 201
      CALL TABPRT(2HYT,YT,11,10,0)
  201 RETURN
      END
```

```
*DECK SCALE
      SUBROUTINE SCALE(UU,TWOJ,NREG,X)
CSCALE          TURBULENCE SCALE/SINGLE,COANNULAR/COPLANAR JETS
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA       , CMPRS       , QJET        , TURBJ       , COEF(10)    ,
     * NPU        , NPD         , DXC         , XU          , XDD         ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
      COMMON /BCO/  U0, E0, TH0
      COMMON /CTRL2/
     * EDGEI  , SFI    , MERGE  , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI  , CEPTO
      LOGICAL MERGE
      DIMENSION UU(1)
      INTEGER TWOJ
      COMMON /EDGE/  YJETE,SFEDGE
      COMMON /PROPJ2/  MACHO,REFLO,YI,YO,MERGP
      LOGICAL MERGP
      COMMON /PROPJT/
     * P         , PRL       , PRT       , RGAS      , SC        ,
     * TREF      , MUREF     , MACH      , XLC       ,
     * REFL      , C         , CHI       , RNORM     ,
     * RHO(200)    , MUL(200)    , KCP(200)    ,
     * MUEFF(200) , XLN(200)   , DK(200)     , RETURB(200)
      COMMON /CPROP/ CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /OUTMIX/ NXORIG
C*
      EQUIVALENCE  (C6,COEF(6))
C*
```

```
    1 GO TO  (100,200)  ,  TWOJ
C*
C*  SINGLE JET-- COMPUTE LOCAL WIDTH OF MIXING ZONE
C*
  100 GO TO  (140,120,120) , NREG
  120 REFL=C6*YJETE
      GO TO 160
  140 DO 143 L=1,NPU
      IF(UU(L).NE.UCL1)  GO TO 144
  143 CONTINUE
  144 REFL=C6*(YJETE-Y(L-1))
C*
  160 RETURN
C*
C*
C*  COANNULAR/COPLANAR JET
C*
C*  TEST MERGE TO DETERMINE IF UP/DN-STREAM OF MERGE STATION
C*
  200 TEST1=U0-1.E-6
      TEST2=U0+1.E-6
      IF(MERGE)  GO TO 260
C*
C*  UPSTREAM-- COMPUTE  REFL,REFLO,YI,YO
C*
  210 YO=C6*YJETE
      YI=C6*EDGEI
C*
C*  SCAN UU TABLE FOR BOUNDARIES OF MIXING ZONES
C*
      DO 220 L=1,NPU
      IF(UU(L).NE. UCL1)  GO TO 222
  220 CONTINUE
  222 LK=L-1
      REFL=YI-C6*Y(LK)
      DO 225 L=LK,NPU
      IF(UU(L).GT.TEST1  .AND.  UU(L).LT. TEST2)  UU(L)=U0
      IF(UU(L).EQ.U0)  LJ=L
  225 CONTINUE
C*
  230 REFLO=YO-C6*Y(LJ)
      GO TO 500
C*
C*  DOWN STREAM-- DETERMINE BOUNDARIES OF MIXING ZONES//
C*  USE LINEAR EQUATIONS FOR NOZZLE/MERGE POINT LINES
  260 YI=(SLOPEO*X+CEPTO)  *C6
      YO=C6*YJETE
      REFLO=YO-C6*(SLOPEI*X+CEPTI)
      DO 270 L=1,NPU
      IF(UU(L).NE.  1.)  GO TO 275
  270 CONTINUE
C*
  275 REFL=YI-C6*Y(L-1)
C*
  500 RETURN
      END
```

```
*DECK THRUST
      SUBROUTINE  THRUST(NX)
CTHRUST        CALCULATE NET THRUST--LBF
      INTEGER TWOJ, ITWO
      LOGICAL SUPC,SUPSTP
      LOGICAL SUBSON
      LOGICAL TROUBL
      LOGICAL DPRIN
      LOGICAL LAST,CORSTP,ADDP,ENTRY1,IER
      LOGICAL  EOF  ,  ERR
      LOGICAL  AXI , XPRN , CMPRS , QJET , TURBJ , CORE
      REAL KCP,MUL,MUEFF,MACH
      REAL  MJET , ME , MUREF
      COMMON /JETTWO/
     * TWO    , DIAO   , MJETO   , TJETO   , VJETO  ,
     * PTJETO , TIJETO , NJO
      REAL  MJETO,MACHO
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI    , MERGE  , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI   , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
      COMMON /SETNEW/  LEDGE, LCOREN
      COMMON /INP1  /        ENTRY1
      COMMON /MISC/ PM(10)
      COMMON /PARAM/
     * AL(200)  , BE(200)  , GM(200)  ,
     * EPS(200) , DL(200)  ,
     * VAR(200) , DVAR(200),
     * SM1(200) , NM1       , SM(200)  , NM        ,
     * DX  ,
     * B1   , C11  , D1  ,
     * AN   , BN   , DN
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ         , MJET         , TJET         , PTJET        , VJET         ,
     * TIJET        ,
     * PE           , VE           , ME           , TIE          , TE           ,
     * AXI          , NJ           , NMAX         ,
     * XJ(100)      , XPRN(100)    ,
     * GAM          , RG           , PR           , PRT          ,
     * SC           , TREF         , MUREF
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA         , CMPRS        , QJET         , TURBJ        , CDEF(10)     ,
     * NPU          , NPD          , DXC          , XU           , XDD          ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
```

```
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
      COMMON /CORED/ XCORE  , CORE  , CORSTP
C*
      COMMON /SUPER/ SUPC,SUPSTP,XSUP
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP  , SV  , SLEN
C*
      COMMON /JET/
     * B(100)    , UC(100)   , TC(100)   , TIC(100) ,
     * PTC(100) , WJ(100)   , YJ(100)
C*
      COMMON /PROPJT/
     * P         , PRL       , PRTT      , RGAS      , SCC       ,
     * TREFF     , VSREF     , MACH      , XLC       ,
     * REFL      , C         , CHI       , RNORM     ,
     * RHO(200)     , MUL(200)     , KCP(200)     ,
     * MUEFF(200) , XLN(200)     , DK(200)      , RETURB(200)
      COMMON /XPRIN/ DPRIN
      COMMON /EDGE/  YJETE   ,   SFEDGE
      COMMON /UMESH/ DUMU1(4),CXPC,CXTP,NRED
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                  P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /THERM/ GMC(200),CP(200)
C*
      COMMON /OUTMIX/ NXORIG
      COMMON /CBODY/ YCB(100),CLSPCB(100),YCB1,UCL1
      COMMON /THRST/  WV(100)
      DIMENSION STORI(200),THR(200)
      EQUIVALENCE  (STORI(1),AL(1)),(THR(1),BE(1))
      DATA  PI/3.141592654/
C*
C*  IF MIXING ZONE HAS INTERSECTED PLUG-- TERMINATE
C*
      EPS=1.
```

```
      IF(AXI)  EPS=2.
    1 YPLUG=YCB(NX)
      UP=YDF(YPLUG,Y,UD,1,NPD)
      IF(UP.EQ. UCL1)  GO TO 10
       IF(YPLUG .EQ. 0.)  GO TO 10
      WRITE  (6,100) NX
  100 FORMAT(//6X,28HMIXING ZONE INTERSECTED PLUG/,6X,7HSTATION,
     *  I7//12X,22HCALCULATION TERMINATED)
      ERR=.TRUE.
      GO TO 1000
C*
C*  CALCULATE THRUST OF JET STREAM
C*
   10 DO 15 L=1,NPD
      REXP=1.
      IF(AXI) REXP=Y(L)
   15 STORI(L)=RHO(L)*UD(L)*UD(L)*REXP
      THR(1)=0.
      CALL INTG(STORI,Y,THR,2,NPD)
      TJ=THR(NPD)/GC
C*
      IF(UPSTRM) GO TO 19
      TU=0.
      GO TO 50
C*
C*  THRUST OF UNENTRAINED FLOW
C*
   19 IF(NX.NE.1) GO TO 20
      TU=144.*PE/(RG*TE)*(VE/VJET)**2/(GC*EPS)*(YR(1)**EPS-Y(NPD)**EPS)
      GO TO 50
   20 TU=RHO2*(V2/VJET)**2/(GC*EPS)*(YDD**EPS-YJETE**EPS)
C*
C*
C*  CALCULATE NET THRUST
C*
   50 TERM=VJET**2*DIAJ/FOOT
      IF(AXI) TERM=PI*DIAJ*TERM/(2.*FOOT)
      TN=TERM*(TJ+TU)
C*
   60 WV(NX)=TN
C*
 1000 RETURN
      END
```

```
*DECK YOF
      FUNCTION YOF(X1, X,Y,IA,IB)
CYOFX11
      COMMON /YOFXI/ I
      DIMENSION X(10),Y(10)
      I1=IA+1
      I2=IB
      I=MINO(MAXO(I1,I),I2)
      N=I2
   40 IF(N) 42,999,42
   42 N=N-1
   53 F=(X1-X(I-1))/(X(I)-X(I-1))
   55 IF(F) 60,100,70
   60 IF(I-I1) 65,100,65
   65 I=I-1
      GO TO 40
   70 IF(F-1.) 100,100,72
   72 IF(I-I2) 74,100,74
   74 I=I+1
      GO TO 40
  999 STOP
      RETURN
  100 YOF =Y(I-1) + (Y(I)-Y(I-1))*F
      RETURN
      END
```

```
*DECK JTMIX1
      OVERLAY(SSNOISE,1,1)
      PROGRAM JTMIX1
C        MAIN---- JETMIX OVERLAY(1,1)
C
    1 CALL JETINP
    2 RETURN
      END
```

```
*DECK FILL
      SUBROUTINE FILL(X,Y,NA,NB)
CFILL
C     LINEAR INTERPOLATION TO FIL VACANCIES IN INPUT LISTS
      COMMON /CBITS/BITS
      DIMENSION X(10),Y(10)
C     FIND IA,IB - VACANT REGION
      IA=NA+1
      IF(Y(IA-1).EQ.BITS) GO TO 99
    3 DO 4 I=IA,NB
      IF(Y(I).NE.BITS) GO TO 5
    4 CONTINUE
      IB=NB
      GO TO 7
    5 IB=I-1
      IF(I.EQ.IA) GO TO 12
C     FILL VACANCIES
      IF(Y(IB+1).NE.Y(IA-1)) GO TO 9
C     ALL VALUES THE SAME
    7 DO 8 II=IA,IB
    8 Y(II)=Y(IA-1)
      GO TO 12
C     INTERPOLATE
    9 DX = X(IB+1) - X(IA-1)
      DO 11 II=IA,IB
   11 Y(II) = (Y(IB+1)*(X(II)-X(IA-1)) + Y(IA-1)*(X(IB+1)-X(II)))/DX
C     GO BACK AND SEARCH FOR MORE REGIONS
   12 IA = IB+2
      IF(I.LT.NB) GO TO 3
   99 RETURN
      END
```

```
*DECK ISORT
      SUBROUTINE ISORT(JMIX,TAB,NB,B,NDB)
CISORT  GE ISORT SIMULATOR-- MOVE DATA TO INPUT ARRAYS
      COMMON /CBITS / BITS,BLANK

      COMMON /INPJET/ DUM1(14), X(100), XPRN(100) , DUM2(7)
      COMMON /MIXER / MIX,RD(100),XD(100),DUM3(101)
      COMMON /CBODY / YCB(100),DUM4(102)

      DIMENSION B(1)
      LOGICAL      JMIX

      I      = 1
      IF( JMIX ) GO TO 20
      NCOL   = 2
      DO 5 J=1,NDB,NCOL
      IF( B(J).EQ.BITS ) GO TO 50
      X(I)   = B(J)
      XPRN(I)= B(J+1)
      I      = I+1
    5 CONTINUE
      GO TO 50

   20 NCOL   = 4
      DO 25 J=1,NDB,NCOL
      IF( B(J).EQ.BITS ) GO TO 50
      XD(I)  = B(J)
      RD(I)  = B(J+1)
      YCB(I) = B(J+2)
      XPRN(I)= B(J+3)
      I      = I+1
   25 CONTINUE

   50 RETURN
      END
```

```
*DECK JETINP
      SUBROUTINE JETINP
CJETINP          JET--INPUT ROUTINE
      LOGICAL TAPIN,  TAPOT
      INTEGER PLOT
      LOGICAL MCHANG
      LOGICAL AMBTO
      LOGICAL DPRIN
      LOGICAL  EOF   ,  ERR
      LOGICAL AXI,CMPRS,QJET,TURBJ,CORE
      INTEGER XPRN
      LOGICAL ENTRY1
      REAL  MJET , ME , MUREF
      REAL MACH
      COMMON /FILK/CSC
      COMMON/CUPDAT/MAP,IMAP,NDIGIT(14)
      COMMON /SING/  SSD(43)
      COMMON /CARRY/ NEW
      LOGICAL  NEW
      COMMON /RSTART/ NREG,RESTRT,NRES,MIXPRE
      LOGICAL  MIXPRE
      COMMON /EDGE/  YJETE,  SFEDGE
      COMMON /JETTWO/ JTWO,ZDIAO(6),NJO
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI    , MERGE  , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI  , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
      COMMON /PROPJ2/ MACHO,REFLO,YI,YO,MERGP
      REAL MACHO,MJETO
      COMMON /MISC/ PM(10),  PLOT
      COMMON /INP1/ ENTRY1
      COMMON /UMESH/MCG(7)
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * ZDIAJ(11),JAXI,NJ,NM,X(100),XPRN(100),GAM,ZRG(6)
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA       , CMPRS       , QJET        , TURBJ       , COEF(10)    ,
     * NPU  ,  NPD  , DXC  , XU  , XDD  ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
```

```
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
      COMMON /CORED/ XCORE  , CORE  , CORSIP
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP  , SV  , SLEN
C*
C****** JET PROPERTIES COMMON
C*
      COMMON /JET/
     * BB(100),UC(100),TC(100),TIC(100),
     * FTC(100) , WJ(100)  , YJ(100)  ,
     * YSONIC(100)
      COMMON /JET1/ FLOWJ,TTO,NX,EJET
      COMMON /PROPJT/
     * P        , PRL      , PRTT     , RGAS     , SCC      ,
     * TREF     , VSREF    , MACH     , XLC      ,
     * DUM(1404)
      COMMON /XPRIN/ DPRIN
      COMMON /CPROP/ CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CT10
      COMMON /CPROP2/  CTP,  CTS  ,  CTM
      COMMON /RATIO/  AMBTO
      COMMON /IOFILE/  TAPIN,TAPOT
      COMMON /PARAM/ B(500),DIAJ(1),MJET,TJET,PTJET,VJET,
     * TIJET,PE,VE,ME,TIE,TE,AXI,RG(1),PR,PRT,SC,TREF,
     * MUREF,TWO,DIAO(1),MJETO,TJETO,VJETO,PTJETO,
     * TIJETO,MCHANG(1),CK,DY1,NMSH,CXPC,CXTP,NRED,
     * MIX,SUPB,MAXIT,TOL,CF,NB(1),TAB(5),NO(1),TAD(4),
     * D(800),DUMINP(461)
C*
      COMMON /MIXER/ JMIX,RD(100),XD(100),ZCF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ NMAXIT,JSUP,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,ZTOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /OUTMIX/ NXORIG
      COMMON /INNAME/ MNB(6),MND(5)
      COMMON /TAG/  DUMID(40)  , IDENT(10)
      COMMON /DIFEQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /DICTRL/ DIFF , CND(10)
      LOGICAL            DIFF
      COMMON /MOLES/ ALX(200,6)
```

```
      COMMON/RCMOL/ALEDGE(6),ALO(6)
      COMMON /JET3/  STADD,NV,STATE
      LOGICAL LTERP
      COMMON /LLTERP/ LTERP
      COMMON /SCALE1/ SCALEC
      LOGICAL          SCALEC
C*
      DIMENSION IMP(10)
      EQUIVALENCE (IMP(1),PM(1))
      DIMENSION XPRN1(100)
      EQUIVALENCE (XPRN1(1),XPRN(1))
      DIMENSION ICHANG(1)
      DIMENSION DMOL(6)
      EQUIVALENCE (ICHANG(1),MCHANG(1))
      EQUIVALENCE (IAXI,AXI),(ITWO,TWO),(ISUP,SUPR),(IMIX,MIX)
      EQUIVALENCE (IBITS,BITS)
      DIMENSION TID(200)
      EQUIVALENCE (TID(1),ED(1))
      LOGICAL          JAXI,JMIX,JTWO,JSUP
      DIMENSION XAC(72) , IXPRAC(72)
      DATA XAC/0.,.0001,.0002,.0003,.0005,.0008,.001,.002,.004,.006,
     * .008,.01,.015,.017,.02,.04,.06,.08,.1,.12,.2,.25,.3,.34,.4,.45,
     * .5,.55,.6,.65,.7,.8,1.,1.2,1.5,1.7,2.,2.5,3.,3.4,4.,5.,6.,6.2,
     * 6.5,6.8,7.,7.5,8.,9.,10.,11.,12.,13.,14.,15.,16.,17.,18.,19.,
     * 20.,21.,22.,23.,24.,25.,26.,28.,30.,32.,34.,36./
      DATA IXPRAC/11*-1,1,2*-1,3*1,-1,1,-1,1,-1,1,-1,1,-1,1,
     * 3*-1,1,-1,1,3*-1,2*1,-1,1,-1,1,-1,1,3*-1,1,-1,1,-1,1,-1,
     * 1,-1,1,4*-1,2*1,7*-1,1,2*-1/
      NAMELIST /A/ DIAJ,MJET,TJET,PTJET,VJET,
     * TIJET        ,
     * PE           , VE            , ME            , TIE           , TE           ,
     * AXI          , NJ            , NM            ,
     * GAM          , RG            , PR            , PRT           ,
     * X            , XPRN          ,
     * SC           , TREF          , MUREF         ,
     * SP           , SV            , SLEN          ,
     * DPRIN         ,PLOT          ,
     * NRED         , PM            ,
     * CXPC         , CXTP          ,
     * MCHANG     , IDENT       ,
     * Y  , UD , THD , ED , TID ,
     * CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,
     * CTM,CTS,CTP,B,NB,TAB,D,ND,TAD,RESTRT,
     * CK,DY1,NMSH,MIX,MAXIT,CF,TOL,SUPR,RD,XD,YCB,
     * TWO         , DIAO         , MJETO      , TJETO      ,
     * VJETO,PTJETO,TIJETO,NJO,
     * NC,CNAME,ALJ,ALJO,ALE,SCM,TCPRF,HCPRF,CPC,ALX,DIFF,
     * CSC,NDIGIT,LTERP,SCALEC
      DATA BLANK/10H          /
C*
C*
C*   READ NAMELIST $A
C*
    2 CALL JTINIT
      CALL SETM(1,BITS,Y,800)
      Y(1)=BITS
```

AD-A038 614 GENERAL ELECTRIC CO CINCINNATI OHIO AIRCRAFT ENGINE GROUP F/G 20/1
SUPERSONIC JET EXHAUST NOISE INVESTIGATION. VOLUME III. COMPUTE--ETC(U)
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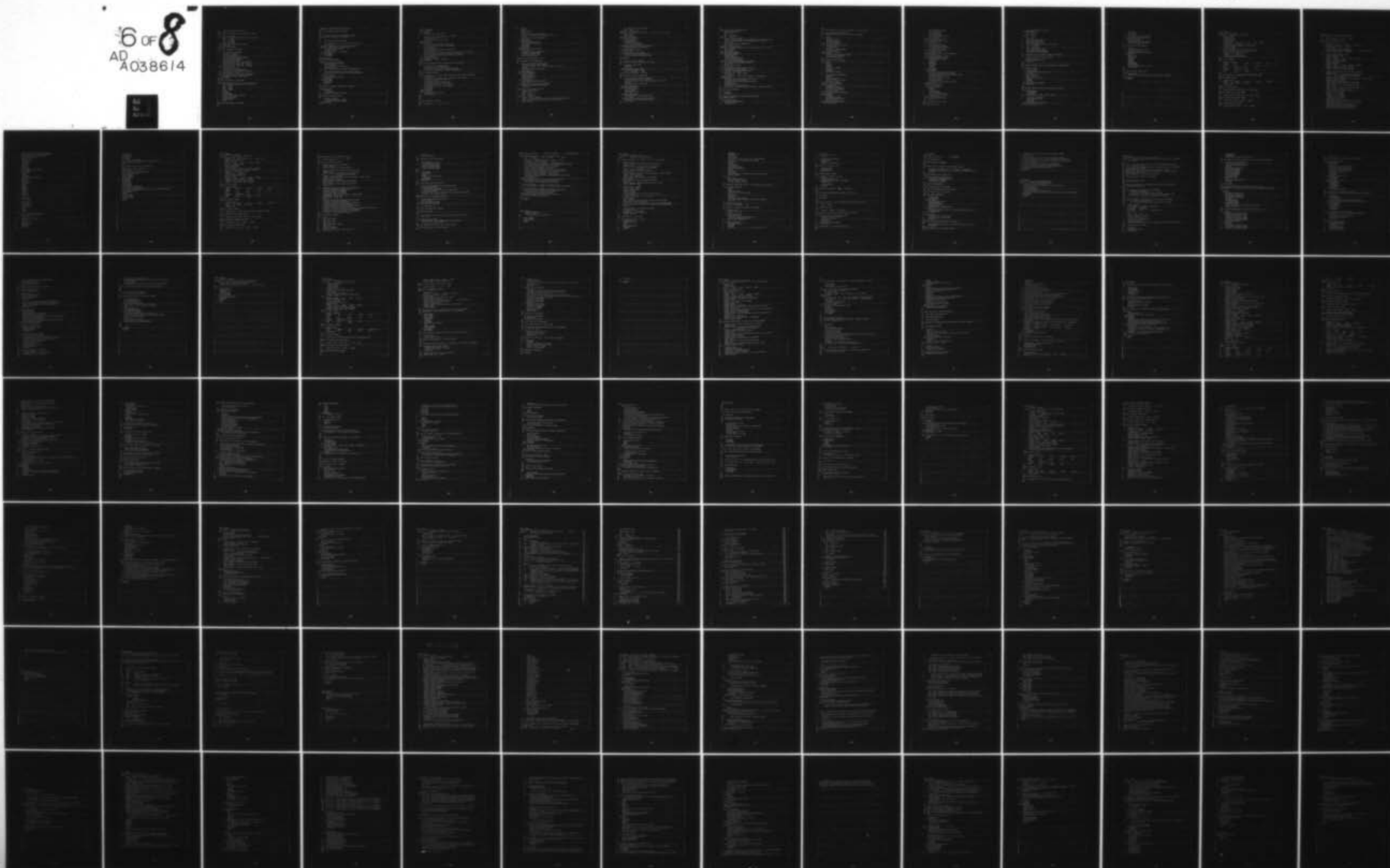
AD A038614




8

```
      CALL SETM(1,BLANK,IDENT,10)
C*
C*  INITIALIZE B ARRAY, DUMMY SINGLE CELL INPUT
C*
      ERR   = .FALSE.
 4000 CALL SETM(4,BITS,B,543,ND,805,X,100,XD,100)
      AXI   = .TRUE.
      TWO   = .FALSE.
      MIX   = .FALSE.
      SUPB  = .FALSE.
 4096 IF(TAPIN)  CALL JTFILE(3,DUMYF)
    3 READ (5,A)
  999 IF( ERR ) RETURN
C*
C*  RESET POSSIBLE BITS VALUES
C*
      IF( .NOT.AXI ) JAXI=AXI
      IF( MIX ) JMIX=MIX
      IF( TWO ) JTWO=TWO
      IF( SUPB ) JSUP=SUPB
      IF(MAXIT.NE.IBITS) MMAXIT=MAXIT
      IF(TOL.NE.BITS) ZTOL=TOL
      IF(CF.NE.BITS) ZCF=CF
      IF(CXPC.EQ.BITS .AND. TWO) CXPC=.04
      IF(CXTP.EQ.BITS .AND. TWO) CXTP=.04
      IF(CXPC.EQ.BITS .AND. MIX)  CXPC=.05
      IF(CXTP.EQ.BITS .AND. MIX)  CXTP=.05
 4001 DO 4010 L=1,11
      IF(L.GT.6) GO TO 4002
      IF(RG(L).NE.BITS) ZRG(L)=RG(L)
      IF(DIAO(L).NE.BITS) ZDIAO(L)=DIAO(L)
 4002 IF(L.GT.7) GO TO 4003
      IF(ICHANG(L).NE.IBITS) MCG(L)=ICHANG(L)
 4003 IF(DIAJ(L).NE.BITS) ZDIAJ(L)=DIAJ(L)
      IF(NB(L).NE.IBITS) MNB(L)=NB(L)
 4010 CONTINUE
C*
C*  MOVE DATA BACK TO DUMMY ARRAY
C*
 4020 CALL MOVE(5,ZDIAJ,DIAJ,11,1,MCG,MCHANG,7,1,
     * ZDIAO,DIAO,6,1,ZRG,RG,6,1,MNB,NB,11,1)
      AXI   = JAXI
      TWO   = JTWO
      SUPB  = JSUP
      MIX   = JMIX
      CF=ZCF
      TOL=ZTOL
      MAXIT=MMAXIT
      IF(MIX .AND. TWO)  GO TO 444
      IF(TWO)  CTI=.175
      IMP(1)=IFIX(PM(1))
      CMPRS=.FALSE.
      KGO=2
C*
C*  MOVE INPUT ARRAYS TO STORAGE
C*
```

```
 4030 CALL ISORT(JMIX,TAB,NB,B,100*NB)
C*
C*  COUNT NUMBER OF AXIAL STATIONS
C*
C*
C*  IF MIXER NOZZLE CASE, NON-DIMENSIONALIZE
C*  AND CURVE FIT DUCT CO-ORDINATES
C*
C
C     INITIALIZE ACOUSTIC STATIONS
C
      IF( X(1).EQ.BITS .AND. (.NOT.MIX)) GO TO 4031
      GO TO 4032
 4031 CALL MOVE(2,XAC,X,72,1,IXPRAC,XPRN,72,1)
 4032 IF( RESTRT.NE.BITS ) GO TO 4300
      IF(.NOT.MIX) GO TO 4442
      DO 4440 L=1,100
      IF(XD(L).EQ.BITS) GO TO 4445
 4440 CONTINUE
      ERR=.TRUE.
      GO TO 999
C*
 4445 NXTA=L-1
C*  FILL UNFILLED ARRAYS
C*
 4040 CALL FILL(XD,RD,1,NXTA)
      CALL FILL(XD,YCB,1,NXTA)
      TERMD=1./DIAJ
      CALL FMPYC(1,TERMD,XD,X,NXTA)
      TERMD=2./DIAJ
      CALL FMPYC(2,TERMD,RD,YR,NXTA,YCB,YCB,NXTA)
C*
      CALL LCFIT(XD,YR,NXTA,1,XD(1),Y99,1,0,CLSP)
      CALL LCFIT(XD,YCB,NXTA,1,XD(1),YCB1,1,0,CLSPCB)
      GO TO  6
 4442 DO 4 L=1,100
      IF(X(L).EQ.BITS) GO TO 5
    4 CONTINUE
  444 ERR=.TRUE.
      GO TO 999
    5 NXTA=L-1
      GO TO 6
C*
C*  SPECIAL  X-TABLE PROCESSING ON RESTART
C*
 4300 NXX=NXTA+1
      NXD=NV+1
      XLOC=RESTRT
      IF(MIX)  RESTRT=RESTRT/DIAJ
C*
C*  SEARCH FOR RESTART LOC.
C*
      DO 4310 L=1,100
      IF(X(L).EQ. RESTRT)  NRES=L
      IF(X(L).EQ.BITS) GO TO 4320
 4310 CONTINUE
```

```
 4311 ERR=.TRUE.
      GO TO 999
 4320 NXTA=L-1
      IF(NRES .EQ. 1) GO TO 4311
C*
      IF((.NOT. MIX) .AND. MIXPRE)  GO TO 4329
      IF(.NOT. MIX)  GO TO 6
      DO 4340 L=1,100
      IF(XD(L).EQ. BITS) GO TO 4350
 4340 CONTINUE
 4350 NXORIG=L-1
      CALL FILL(XD(NXD),RD(NXD),NXD,NXORIG)
      CALL FILL(XD(NXD),YCB(NXD),NXD,NXORIG)
      TERMD=1./DIAJ
      NUM=NXORIG+1-NXD
      CALL FMPYC(1,TERMD,XD(NXD),X(NXX),NUM)
      TERMD=2.*TERMD
      CALL FMPYC(2,TERMD,RD(NXD),YR(NXD),NUM,YCB(NXD),YCB(NXD),NUM)
      CALL LCFIT(XD,YR,NXORIG,1,XD(1),Y99,1,0,CLSP)
      CALL LCFIT(XD,YCB,NXORIG,1,XD(1),YCB1,1,0,CLSPBC)
      NXTA=NXX+NUM-1
 4329 DO 4328 L=1,NXTA
      IF(XLOC .EQ. XD(L))  PE=PD(L)
 4328 CONTINUE
C*
C*  TEST FOR COMPRESSIBILITY,TRANSPORT OF Q--INITIALIZE
C*
    6 IF(MJET.NE.BITS) CMPRS=.TRUE.
      IF(PTJET.NE. BITS) CMPRS=.TRUE.
      IF(.NOT. CMPRS) CALL SETM(1,BITS,PTC,100)
      IF(MIX .AND. (RESTRT.EQ. BITS))  NXORIG=NXTA
C*
C*  SET PRINT INDICATOR
C*
 4050 IF((XPRN(1).EQ.2) .OR. (XPRN1(1).EQ.2.)) CALL SETM(1,1,XPRN(2),
     *  NXTA-1)
      IF((XPRN(1) .EQ. (-2))  .OR.  (XPRN1(1) .EQ. (-2.)))
     X  CALL SETM(1,-1,XPRN(2),NXTA-1)
      DO 4060 L=2,NXTA
      IF(XPRN(L).EQ.IBITS) XPRN(L)=0
      IF(XPRN1(L) .EQ. 0.)  GO TO 4060
      IF(IABS(XPRN(L)) .EQ. 1)  GO TO 4060
      IF(XPRN1(L) .LT. 0.)  GO TO 4055
      XPRN(L)=1
      GO TO 4060
 4055 XPRN(L)=-1
 4060 CONTINUE
      IF(TIJET.NE.0.) GO TO 10
      TURBJ=.FALSE.
C*
C*
C*
C*
   10 IF(CMPRS)  GO TO 12
C*
C*  VJET,VE,TJET,TE    ASSUMED GIVEN
```

```
C*
      MJET=0.
      ME=0.
      CP=GAMH(TJET)
      CPJ = CP
      EJET=1.5/GCJ*TIJET**2*VJET**2
      IF(TWO)  EJETO=1.5/GCJ*TIJETO**2*VJET**2
      TTE=TE
      PTE=PE*(1.+.5*VE**2/(GC*RG*TE))
      GO TO 150
   12 GAM=GAMH(TE)
      VSE=SQRT(GAM*RG*GC*TE)
      IF(ME.EQ.BITS) GO TO 122
      VE=ME*VSE
      GO TO 125
  122 ME=VE/VSE
  125 TRM=1.+.5*(GAM-1.)*ME**2
      TTE=TE*TRM
      PTE=PE*(TRM)**(GAM/(GAM-1.))
      IF(MJET.EQ. BITS) KGO=1
      IF(PTJET.EQ.BITS) KGO=2
      GO TO (130,140),KGO
C*
  140 IF(TJET.NE.BITS) GO TO 141
C*
C*  DETERMINE TJET (GAM=GAM(T))
C*
      TLT=VJET*VJET/(RG*GC*MJET*MJET)
      TJET=(TLT/2.23708)**(1./.92979)
      IF(TJET.GT. 800.  .AND.  TJET.LT.3600.) GO TO 1410
      GAM=1.4
      IF(TJET.GE.3600.) GAM=1.254
      GO TO 1411
 1410 GAM=GAMH(TJET)
 1411 GAM1=GAM/(GAM-1.)
      GAM2=.5*(GAM-1.)
      GAM3=1./GAM1
      CP=GAM1*RG*GC/GCJ
      GO TO 142
  141 GAM=GAMH(TJET)
      VJET=MJET*SQRT(GAM*RG*GC*TJET)
      GO TO 1411
  142 EJET=1.5/GCJ*TIJET*TIJET*VJET*VJET
      PTJET=PE*(1.+GAM2*MJET**2)**GAM1
      GO TO 150
C*
  130 IF(VJET.EQ.BITS) GO TO 131
      ASSIGN 1312 TO KFGO
      GAMG  = 1.38
      IT    = 0
      PRAT  = PTJET/PE
 1301 IT    = IT+1
      GAMG1 = (GAMG-1.)/GAMG
      TJET  = VJET**2*(GAMG-1.)/(2.*GAMG*RG*GC*(PRAT**GAMG1-1.))
      IF( TJET.GE.800. .AND.TJET.LT.3600. ) GO TO 1302
      GAM   = 1.4
```

```
      IF( TJET.GE.3600. ) GAM=1.254
      GO TO 1303
 1302 GAM   = GAMH(TJET)
 1303 IF( (ABS(GAM-GAMG)).LE. .001  .OR. IT.GE.10 ) GO TO 1311
      GAMG  = GAM
      GO TO 1301
 1310 GAM=GAMH(TJET)
 1311 GAM1=GAM/(GAM-1.)
      GAM2=.5*(GAM-1.)
      GAM3=1./GAM1
      CP=GAM1*RG*GC/GCJ
      TTRJ=(PTJET/PE)**GAM3
      GO TO KPGO,(1312,1364)
 1312 EJET=1.5/GCJ*TIJET*TIJET*VJET*VJET
      MJET=VJET/SQRT(GAM*RG*GC*TJET)
      GO TO 150
  131 ASSIGN 1364 TO KPGO
      GO TO 1310
 1364 MJET=SQRT((TTRJ-1.)/GAM2)
      VJET=MJET*SQRT(GAM*RG*GC*TJET)
      EJET=1.5/GCJ*TIJET*TIJET*VJET*VJET
C*
  150 CPJ=CP
C*
      IF(.NOT. TWO) GO TO 151
C**  LOGIC FOR FLOW CONDITIONS OF OUTER JET
C**
      IF(CMPRS)  GO TO 160
      MJETO=0.
      GO TO 151
  160 IF(MJETO.EQ.BITS)  KHO=1
      IF(PTJETO.EQ.BITS)  KHO=2
      GO TO  (170,165)  ,  KHO
  165 IF(TJETO.NE.BITS)  GO TO 168
C*
C*  DETERMINE TJETO (GAMO=GAMO(T))
C*
      TLT=VJETO*VJETO/(RG*GC*MJETO*MJETO)
      TJETO=(TLT/2.23708)**(1./.92979)
      IF(TJETO.GT.800.  .AND.  TJETO.LT.3600.) GO TO 1610
      GAMO=1.4
      IF(TJETO.GE.3600.) GAM=1.254
      GO TO 1611
 1610 GAMO=GAMH(TJETO)
 1611 GAM1=GAM/(GAM-1.)
      GAM2=.5*(GAM-1.)
      GAM3=1./GAM1
      CP=GAM1*RG*GC/GCJ
      GO TO 169
  168 GAMO=GAMH(TJETO)
      VJETO=MJETO*SQRT(GAMO*RG*GC*TJETO)
      GO TO 1611
  169 EJETO=1.5/GCJ*TIJETO*TIJETO*VJET*VJET
      PTJETO=PE*(1.+GAM2*MJETO**2)**GAM1
      GO TO  151
C*
```

```
C*
  170 IF(VJETO.EQ. BITS) GO TO 171
      ASSIGN 1712 TO KPGO
      GAMG  = 1.38
      IT    = 0
      PRAT  = PTJETO/PE
 1701 IT    = IT+1
      GAMG1 = (GAMG-1.)/GAMG
      TJETO = VJETO**2*(GAMG-1.)/(2.*GAMG*RG*GC*(PRAT**GAMG1-1.))
      IF( TJETO.GE.800. .AND. TJETO.LT.3600. ) GO TO 1702
      GAMO  = 1.4
      IF( TJETO.GE.3600. ) GAMO=1.254
      GO TO 1703
 1702 GAMO  = GAMH(TJETO)
 1703 IF( (ABS(GAMG-GAMO)).LE. .001  .OR. IT.GE.10 ) GO TO 1711
      GAMG  = GAMO
      GO TO 1701
 1710 GAMO=GAMH(TJETO)
 1711 GAM1=GAMO/(GAMO-1.)
      GAM2=.5*(GAMO-1.)
      GAM3=1./GAM1
      CP=GAM1*RG*GC/GCJ
      TTRJO=(PTJETO/PE)**GAM3
      GO TO KPGO,(1712,1764)
 1712 EJETO=1.5/GCJ*TIJETO*TIJETO*VJET*VJET
      MJETO=VJETO/SQRT(GAMO*RG*GC*TJETO)
      GO TO 151
  171 ASSIGN 1764 TO KPGO
      GO TO 1710
 1764 EJETO=1.5/GCJ*TIJETO*TIJETO*VJET*VJET
      MJETO=SQRT((TTRJO-1.)/GAM2)
      VJETO=MJETO*SQRT(GAM*RG*GC*TJETO)
  151 IF( TWO)  GO TO 152
      IF(TJET.EQ.TE)  QJET=.FALSE.
      GO TO 153
  152 IF(TJET.EQ.TE  .AND.  TJET.EQ.TJETO)  QJET=.FALSE.
  153 CONTINUE
      IF(.NOT. QJET) CALL SETM(1,1.,TC,100)
      EE=1.5/GCJ*TIE*TIE*VJET*VJET
      TTO=TJET+.5*VJET*VJET/(GCJ*CPJ)+EJET/CPJ
      AMBTO=.FALSE.
      DTBO=ABS(TTO-TE)
      IF(DTBO.LT.  .5) AMBTO=.TRUE.
      CALL MOVE(3,DIAO,ZDIAO,6,1,DIAJ,ZDIAJ,11,1,MCHANG,MCG,7,1)
C*
C*  INITIALIZE PROFILES
C*
   20 NJP=NJ+1
      NJM=NJ-1
C*
C*  BOUNDARY CONDITIONS--V/VJET=VE/VJET,THETA=0,
C*  E/EJET=EE/EJET
C*
   23 THEDGE=TE/TJET
      IF(TURBJ) EEDGE=EE/EJET
      UEDGE=VE/VJET
```

```
C*
C*   MESH DEFINITION AT INITIAL STATION-- IF Y(1).NE.BITS,

C*   INPUT PROFILES USED AS GIVEN
C*   NJ=CURRENT SPECIFIED MESH NUMBER OF JET CORNER
C*
      U0=1.
      TH0=1.
      IF(TURBJ)  E0=1.
      DO 2310 LL=1,NC
      ALEDGE(LL)=ALE(LL)
 2310 ALO(LL)=ALJ(LL)
      IF(.NOT. TWO)  GO TO 2313
      TH0=TJETO/TJET
      U0=VJETO/VJET
      IF(TURBJ)  E0=EJETO/EJET
      DO 2311 LL=1,NC
 2311 ALO(LL)=ALJO(LL)
 2313 IGO=1
      IF(RESTRT.NE.BITS) GO TO 3840
      IF(Y(1).NE.BITS) IGO=2
      GO TO (21,30), IGO
C*
C*   GENERATE INITIAL PROFILES
C*
   21 LGO=1
      LOW=2
      NE=NJ+3
      Y(1)=0.
      IF(MIX) Y(1)=YCB1
      UD(1)=1.
      THD(1)=1.
      IF(TURBJ)  ED(1)=1.
C*
      DYI=(1.-Y(1))/FLOAT(NJ-1)
      DY2=.5*DYI
      LHO=1
      IF(TWO)  LHO=2
      IF(.NOT.DIFF) GO TO 2161
      DO 2160 LL=1,NC
 2160 ALX(1,LL) = ALJ(LL)
 2161 GO TO (22,2222),LHO
   22 DU=UEDGE-U0
      DTH=THEDGE-TH0
      IF(TURBJ)  DE=EEDGE-E0
      IF(.NOT.DIFF) GO TO 26
      DO 2170 LL=1,NC
 2170 DMOL(LL)=ALEDGE(LL)-ALO(LL)
      GO TO 26
 2222 DU=U0-1.
      DTH=TH0-1.
      IF(TURBJ)  DE=E0-1.
      IF(.NOT.DIFF) GO TO 26
      DO 2171 LL=1,NC
 2171 DMOL(LL)=ALO(LL)-ALJ(LL)
   26 DO 27 L=LOW,NE
```

```
      IF(L.GT.NJM) GO TO 25
      Y(L)=Y(L-1)+DYI
      UD(L)=UD(LOW-1)
      THD(L)=THD(LOW-1)
      IF(.NOT.TURBJ) GO TO 2619
      ED(L)=ED(LOW-1)
 2619 IF(.NOT.DIFF) GO TO 27
      DO 2620 LL=1,NC
 2620 ALX(L,LL)=ALX(LOW-1,LL)
      GO TO 27
   25 Y(L)=Y(L-1)+DY2
      UD(L)=UD(L-1)+.25*DU
      THD(L)=THD(L-1)+.25*DTH
      IF(.NOT.TURBJ) GO TO 2519
      ED(L)=ED(L-1)+.25*DE
 2519 IF(.NOT.DIFF) GO TO 27
      DO 2520 LL=1,NC
 2520 ALX(L,LL)=ALX(L-1,LL)+.25*DMOL(LL)
   27 CONTINUE
      GO TO  (32,2223)  ,  LHO
 2223 DIST=DIAO/DIAJ-(1.+DYI)
      DYI=DIST/FLOAT(NJO-NE)
      EDGEI=Y(NE)
      LOW=NE+1
      NE=NJO+3
      NJM=NJO-1
      NJP=NJO+1
      LHO=1
      GO TO 22
   32 NRMN=NM-NE
   31 NE1=NE+1
      CALL SETM(1,UEDGE,UD(NE1),NRMN)
      CALL SETM(1,THEDGE,THD(NE1),NRMN)
      IF(TURBJ) CALL SETM(1,EEDGE,ED(NE1),NRMN)
      BB(1)=Y(NE)-Y(NJM)
      IF(.NOT. DIFF) GO TO 3119
      DO 3120 LL=1,NC
      ALE1=ALEDGE(LL)
      CALL SETM(1,ALE1,ALX(NE1,LL),NRMN)
 3120 CONTINUE
 3119 GO TO (29,40),LGO
   29 DO 28 L=NE1,NM
   28 Y(L)=Y(L-1)+DYI
      NPU=NE
      NPD=NE
      UD(NPU)=UEDGE
      THD(NPU)=THEDGE
      IF(TURBJ) ED(NPU)=EEDGE
      IF(.NOT.DIFF) GO TO 35
      DO 2802 LL=1,NC
 2802 ALX(NPU,LL)=ALEDGE(LL)
      GO TO 35
C*
C*    PROFILES INPUT BY USER
C*
   30 DO 36 L=1,NM
```

```
      IF( Y(L).EQ.BITS ) GO TO 37
   36 CONTINUE
      ERR    = .TRUE.
      GO TO 999
   37 L      = L-1
      NE     = L
      LGO    = 2
      CALL FILL(Y,UD,1,NE)
      CALL FILL(Y,TID,1,NE)
      CALL FILL(Y,THD,1,NE)
C*    PROFILES  DIMENSIONAL-- IN.,FPS.,DEG. R.
      QD     = 2./DIAJ
      QV     = 1./VJET
      QT     = 1./TJET
      CALL FMPYC(1,QD,Y,Y,NE)
      CALL FMPYC(1,QV,UD,UD,NE)
      CALL FMPYC(1,QT,THD,THD,NE)
C
C     CALCULATE TKE FROM INPUT TURBULENT INTENSITY
C
      TKET   = 1.5*VJET*VJET/(GCJ*EJET)
      DO 38 L=1,NE
   38 ED(L) = TKET*TID(L)**2
      GO TO 32
C*
C*
C*  WIDTH OF MIXING ZONE-- Y(NJP)-Y(NJM))--- 3-MESH POINTS
C*
   40 YJETE = Y(NJ)
      UCCL1 = UD(1)
      DO 41 L=2,NJ
      IF( UD(L).NE.UCCL1 ) GO TO 42
   41 CONTINUE
      ERR    = .TRUE.
      GO TO 999
   42 BB(1) = YJETE-Y(L-1)
      NPU=NE
      NPD=NE
      GO TO 35
 3840 CALL JTFILE (4,RESTRT)
      NPU=NPD
C*
C*
C*  COMPUTE CONSTANT TERMS IN COFFICIENTS OF PDEQS
C*
   35 DIA=DIAJ/12.
      YJETE=Y(NPU)
      UCL1=UD(1)
      IF(RESTRT.NE. BITS)  YJETE=YJ(NRES)
C*
      COEF(1)=1./(VJET*DIA)
      IF(TURBJ) GO TO 770
      COEF(2)=0.
      GO TO 769
  770 COEF(2)=VJET/(GCJ*DIA*EJET)
  769 IF(QJET) GO TO 771
```

```
      COEF(3)=0.
      COEF(4)=0.
      GO TO 772
  771 COEF(3)=EJET/(VJET*DIA*TJET)
      COEF(4)=VJET/(GCJ*DIA*TJET)
  772 COEF(5)=DIA/VJET
      COEF(6)=.5*DIA
      COEF(7)=144.*GC/(VJET*VJET)
      COEF(9)=144.*GC/(GCJ*TJET)
C*
C*  INITIALIZE COMMON /PROPJ/
C*
      RGAS=RG
      IF(.NOT.DIFF) GO TO 7772
      WMWT=1545./RGAS
      CND(1)=1./(WMWT*VJET*DIA*TJET)
 7772 MACH=MJET
      P=PE
      VSREF=MUREF
      TREF=TREF
      SCC=SC
      PRL=PR
      PRTT=PRT
      MACHO=MJETO
      ENTRY1=.TRUE.
      IF(RESTRT .NE.BITS) GO TO 996
      CALL JETPRP
C*
C*
C*  PRINT INITIAL STATION DATA
C*
  996 CALL JTOUT1
      IF(TAPOT .AND. RESTRT.EQ. BITS) CALL JTFILE(1,X(NRES))
C*
 1000 RETURN
      END
```

```
*DECK JTINIT
      SUBROUTINE JTINIT
CJTINIT          INITIALIZE NEW PROBLEM
      LOGICAL DPRIN
      INTEGER  PLOT
      LOGICAL ENTRY1
      LOGICAL MCHANG
      LOGICAL ERR
      LOGICAL  AXI , XPRN , CMPRS , QJET , TURBJ , CORE
      REAL  MJET , ME , MUREF
      COMMON /RSTART/ NREG,RESTRT,NRES,MIXPRE
      LOGICAL  MIXPRE
      COMMON /DIFEQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /DICTRL/ DIFF , CND(10)
      LOGICAL           DIFF
      COMMON /MOLES/ ALX(200,6)
      COMMON/BCMOL/ALEDGE(6),ALO(6)
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ        , MJET        , TJET        , PTJET       , VJET        ,
     * TIJET       ,
     * PE          , VE          , ME          , TIE         , TE          ,
     * AXI         , NJ          , NM          ,
     * X(100)      , XPRN(100)   ,
     * GAM         , RG          , PR          , PRT         ,
     * SC          , TREF        , MUREF
C*
C*
C*  MESH COMMON AFTER DISAPPEARANCE OF POTENTIAL CORE
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA        , CMPRS       , QJET        , TURBJ       , COEFF(10)   ,
     * NPU  ,  NPD  , DXC  , XU  , XDC  ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),  PRF(200,3)
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
      COMMON /CORED/ XCORE  , CORE  , CORSIP
```

```
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP   , SV   , SLEN
C*
C****** JET PROPERTIES COMMON
C*
      COMMON /JET/
     * B(100)    , UC(100)   , TC(100)   , TIC(100) ,
     * PTC(100) , WJ(100)   , YJ(100)   ,
     * YSONIC(100)
      COMMON /JET1/ FLOWJ,TTO,NX,EJET
      COMMON /UMESH/ MCHANG,CK,DY1,NMSH       , CXPC,CXTP,NRED
      COMMON /EDGE/  YJETE   ,  SFEDGE
C*
      COMMON /MISC/ PM(10),  PLOT
      COMMON /INP1/  ENTRY1
      COMMON /JETTWO/
     * TWO     , DIAO    , MJETO   , TJETO   , VJETO   ,
     * PTJETO , TIJETO , NJO
      COMMON /BCO/  UO, EO, THO
      REAL  MJETO,MACHO
      COMMON /CTRL2/
     * EDGEI   , SFI     , MERGE   , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI   , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSIO,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /OUTMIX/ NXORIG
      COMMON /INNAME/ NB,TAB(5),ND,TAD(4)
      COMMON /LLTERP/ LTERP
      LOGICAL         LTERP
      COMMON /SCALE1/ SCALEC
      LOGICAL         SCALEC
      DIMENSION TAB1(5),TAD1(4)
      DIMENSION IMP(10)
      EQUIVALENCE (IMP(1),PM(1))
      DIMENSION  HH(3), CPA(3), CPCO2(3), CPH2O(3)
      DIMENSION CTABN(6)
      DATA CTABN/3HAIR,3HCO2,3HH2O,3*1H /
      DATA HH/41593.74,-164431.94,-119593.66/
      DATA CPA/6.4303,8.929E-4,5.989E-8/
      DATA CPCO2/6.214,5.776E-3,-1.094E-6/
```

```
      DATA CPH2O/7.256,1.277E-3,8.735E-8/
      DATA TAB1/1HX,2HXD,2HPD,3HYCH,4HXPRN/
      DATA TAD1/1HY,2HUD,3HTID,3HTHD/
      DATA BITS1/1.E+15/
    1 MCHANG=.TRUE.
      NMSH=71
      CK=1.06064475
      DY1=.001
      CXPC=.02
      CXTP=.02
      NRED=10
      BITS=BITS1
    2 CALL SETM(1,BITS,MJET,10)
      PE=14.69594
      TE=518.688
      TIJET=0.
      TIE=0.
      TWO=.FALSE.
      CALL SETM(1,BITS,MJETO,4)
      TIJETO=0.
      NJO=50
      MERGE=.FALSE.
      AXI=.TRUE.
      NJ=30
      NM=80
      GAM=1.4
      RG=53.34
      PR=.72
      PRT=1.
      SC=201.6
      TREF=0.
      MUREF=0.
C*
    3 QJET=.TRUE.
      TURBJ=.TRUE.
C*
    4 ERR=.FALSE.
      GC=32.174
      GCJ=25036.442
      FOOT=12.
      CORE=.FALSE.
      SP=1.
      SV=1.
      SLEN=1.
C*
    5 CALL SETM(2,BITS,X,100,Y,200)
      CALL SETM(1,0,XPRN,100)
      DPRIN=.FALSE.
C*
      CALL SETM(1,0.,PM,10)
      IMP(1)=0
      PLOT=0
      ENTRY1=.TRUE.
      MIX=.FALSE.
      CF=.002
      MAXIT=25
```

```
      SUPR=.TRUE.
      UPSTRM=.TRUE.
      CVG=.FALSE.
      TOL=1.E-6
      CALL SETM(1,0.,YCH,100)
      CALL SETM(4,BITS,HD,100,XD,100,YR,100,YCD,100)
      CALL SETM(1,0,INDC,100)
      NB=5
      ND     = 4
      CALL MOVE(2,TAB1,TAB,5,1,TAD1,TAD,4,1)
      NC=3
      CALL MOVE(1,CTABN,CNAME,6,1)
      DIFF=.FALSE.
      CALL SETM(2,BITS,ALJ,18,ALX,1200)
      CALL SETM(1,.7,SCM,6)
      ALE(1)=.99934
      ALE(2)=.00033
      ALE(3)=.00033
      ALJ(1)=.92
      ALJ(2)=.04
      ALJ(3)=.04
      ALJO(1)=.96
      ALJO(2)=.02
      ALJO(3)=.02
      CALL SETM(1,0.,HCPRF,24)
      CALL SETM(1,600.,TCPRF,3)
      CALL MOVE(4,HH,HCPRF,3,1,CPA,CPC(1,1),3,1,CPCO2,CPC(1,2),3,1,
     * CPH2O,CPC(1,3),3,1)
      RESTRT=BITS
      NRES=1
      MIXPRE=.FALSE.
      LTEPP= .TRUE.
      SCALEC= .FALSE.
      RETURN
      END
```

```
*DECK JTOUT1
      SUBROUTINE JTOUT1
CJTOUT1            JET OUTPUT AT STATION 1
      LOGICAL  EOF   ,  ERR
      LOGICAL  AXI , XPRN , CMPRS , QJET , TURBJ , CORE
      REAL  MJET , ME , MUREF
      COMMON /JETTWO/
     * TWO    , DIAO    , MJETO   , TJETO   , VJETO   ,
     * PTJETO , TIJETO  , NJO
      REAL  MJETO,MACHO
      COMMON /DIFEQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /DICTRL/ DIFF , CND(10)
      LOGICAL          DIFF
      COMMON /MOLES/ ALX(200,6)
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI    , MERGE   , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI   , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ         , MJET         , TJET         , PTJET        , VJET         ,
     * TIJET        ,
     * PE           , VE           , ME           , TIE          , TE           ,
     * AXI          , NJ           , NM           ,
     * X(100)       , XPRN(100)    ,
     * GAM          , RG           , PR           , PRT          ,
     * SC           , TREF         , MUREF
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA         , CMPRS        , QJET         , TURBJ        , COEF(10)
     * NPU   ,   NPD   , DXC   , XU   , XDD   ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE   , EEDGE   , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
      COMMON /COREC/ XOCORE   , CORE   , CORSTP
```

```
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP   , SV   , SLEN
C*
C****** JET PROPERTIES COMMON
C*
      COMMON /JET1/ FLOWJ,TT0,NX,EJET
      COMMON /ADAM01/
     * NAME(6),ADDRES(6),TITLE(6),IDENT(6)
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
C*
      DIMENSION HEAD1(2,2), HEAD2(2,2), HEAD3(2,2),
     * FORM1(2),FORM2(2),FORM3(2), TI(200)
      DIMENSION HEAD4(2,3),FORM4(2)
      DIMENSION HEAD5(2,2),FORM5(2)
      EQUIVALENCE (TI(1), DSTOR(1))
      EQUIVALENCE (KAXI,AXI), (KQ,QJET), (KMPRS,CMPRS)
      EQUIVALENCE  (KTOW,TWO)
      EQUIVALENCE  (IMIX, MIX)
      DATA
     * HEAD1(1,1),HEAD1(2,1),HEAD1(1,2),HEAD1(2,2)/
     * 5HPLANE,1H ,6HAXISYM,6HMETRIC/,
     * HEAD2(1,1),HEAD2(2,1),HEAD2(1,2),HEAD2(2,2)/
     * 6HISOTHE,4HRMAL,6HN-ISOT,6HHERMAL/,
     * HEAD3(1,1),HEAD3(2,1),HEAD3(1,2),HEAD3(2,2)/
     * 6HINCOMP,5HRESS.,6HCOMPRE,6HSSIBLE/,
     *HEAD4(1,1),HEAD4(2,1),HEAD4(1,2),HEAD4(2,2),HEAD4(1,3),HEAD4(2,3)/
     * 6HSINGLE,1H ,6HCO-PLA,3HNAR,6HCO-ANN,4HULAR/,
     * HEAD5(1,1),HEAD5(2,1),HEAD5(1,2),HEAD5(2,2)/
     * 4HFREE,6H   JET,6HCONFIN,6HED JET/
C*
C*  SET VARIABLE HEADINGS
C*
    1 NAXI  = 1
      IF( AXI ) NAXI=2
      NQ    = 1
      IF( QJET ) NQ=2
      NCMP  = 2
      IF( .NOT.CMPRS ) NCMP=1
      NTOW  = 0
      IF( TWO ) NTOW=1
      NJETT = NTOW+NAXI
      IF(NJETT.EQ. 2  .AND.  AXI)  NJETT=1
```

```
      KMIX  = 1
      IF( MIX ) KMIX=2
C*
C*  CONSTRUCT HOLLERITH HEADINGS
C*
      DO 2 L=1,2
      FORM1(L)=HEAD1(L,NAXI)
      FORM2(L)=HEAD2(L,NQ)
      FORM4(L)=HEAD4(L,NJETT)
      FORM5(L)=HEAD5(L,KMIX)
    2 FORM3(L)=HEAD3(L,NCMP)
C*
C*
      XTREF=TREF
      XMUREF=MUREF
      XSC=SC
      IF(TREF .NE. 0.) GO TO 3
      XTREF=BITS
      XMUREF=BITS
      XSC=BITS
C*
C*  WRITE FIRST SECTION OF OUTPUT
C*
    3 WRITE(6,100)FORM5,FORM1,FORM2,FORM3,FORM4,
     * NAME,ADDRES,IDENT,
     * TE,DIAJ,GAM,PE,MJET,RG,
     * VE,TJET,PR,ME,PTJET,PRT,TIE,VJET,XSC,TIJET,
     * XTREF,FLOWJ,XMUREF
      IF(TWO) WRITE (6,105) DIAO,MJETO,TJETO,PTJETO,VJETO,TIJETO
      IF(.NOT.  TWO)  WRITE (6,110)
C*
C*  CONVERT ED TO TURBULENCE INTENSITY
C*
    4 CONV=SQRT(2.*GCJ*EJET/3.)/VJET
      DO 5 L=1,NPU
    5 TI(L)=CONV*SQRT(ED(L))
C*  CHECK FOR DIFFUSION CASE
C*
      IF(DIFF) GO TO 25
C*
C*  WRITE 2-ND SECTION OF OUTPUT
C*
   10 WRITE (6,150)
C*
C*
   20 WRITE (6,200) (L,Y(L),PSI(L),UD(L),THD(L),TI(L),L=1,NPU)
      GO TO 30
C*
   25 WRITE (6,151) CNAME
      WRITE (6,201) (L,Y(L),PSI(L),UD(L),THD(L),TI(L),
     * (ALX(L,LL),LL=1,6),L=1,NPU)
C*
C*  IF CONFINED MIXING,PRINT PSI OF DUCT SURFACE
C*
   30 IF(MIX) WRITE (6,250) YR(1),PSID
C*
```

```
C**********************         FORMAT STATEMENTS        *********"******
C*
  100 FORMAT(1H1,23X,3H*  ,2A6,11H PROGRAM  *///,
     * 5H *   ,2A6,11H     *  *    ,2A6,10H     *  *  ,2A6,
     * 10H     * JET///,
     * 16X,6H**    ,2A6,2X,20HMIXING  REGION    **///,
     * 1X,6A10/1X,6A10 /1X,6A10//
     * 17X,37H*  INPUT  AND  INITIAL  CONDITIONS  *//,
     * 2X,19HEXTERNAL CONDITIONS,3X,24HJET DISCHARGE PARAMETERS,
     * 5X,14HGAS PROPERTIES//,2X,4HTE =,F14.3,6X,
     * 6HDIAJ =,F13.5,5X,6HGAM  =,F13.5/,2X,
     * 4HPE =,E14.4,6X,6HMJET =,F13.4,5X,
     * 6HRG   =,F13.5/,2X,4HVE =,F14.3,6X,6HTJET =,F13.3,
     * 5X,6HPR   =,F13.5/,2X,4HME =,F14.4,6X,6HPTJET=,
     * E13.4,5X,6HPRT  =,F13.5/2X,4HTIE=,F14.4,
     * 6X,6HVJET =,F13.3,5X,6HSC   =,F13.3/26X,
     * 6HTIJET=,E13.4,5X,6HTREF =,F13.3/26X,6HFLOWJ=,E13.4,5X,
     * 6HMUREF=,E13.4/)
  110 FORMAT(///)
  105 FORMAT(26X,7HDIAO  =,F12.5/26X,7HMJETO =,F12.4/
     * 26X,7HTJETO =,F12.3/26X,7HPTJETO=,E12.4/
     * 26X,7HVJETO =,F12.3/26X,7HTIJETO=,E12.4//)
C*
  150 FORMAT(23X,26H*   INITIAL   PROFILES    *//
     * 1X,1HN,7X,1HY,11X,3HPSI,13X,1HU,11X,5HTHETA,10X,2HTI//)
C*
  151 FORMAT(53X,26H*   INITIAL   PROFILES    *//
     *1X,1HN,7X,1HY,11X,3HPSI,10X,1HU,8X,5HTHETA,9X,2HTI,
     * 7X,A6,5X,A6,5X,A6,5X,A6,5X,A6,5X,A6//)
  200 FORMAT(I3,E12.4,E13.4,2F14.8,E16.7)
  201 FORMAT(I3,E12.4,E13.4,2F11.8,E15.7,6E11.4)
  250 FORMAT(//4HWALL,1PE11.4,E13.4)
C*
 1000 RETURN
      END



*DECK JTMIX2
      OVERLAY(SSNOISE,1,2)
      PROGRAM JTMIX2
C        MAIN ---- JETMIX OVERLAY(1,2)
C
    1 CALL JTCTRL
    2 CALL JTOUTS
    3 RETURN
      END
```

```
*DECK AITER
      SUBROUTINE AITER1(XX,DXX)
CAITER         ITERATION CONTROL ROUTINE
C*
C*   AITER1-- COMPUTE B.C. FOR NEXT TRIAL AT MASS BALANCE
C*
      LOGICAL  ITKX
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /CNERR/ BITS,ERR,GC,GCJ,FOOT
      LOGICAL ERR
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /OUTMIX/ NXORIG
C*
      COMMON /EDGE/  YE,SFE
      COMMON /MISC/  PM(10)
      COMMON /INP1/ ENTRY1
      LOGICAL  ENTRY1
      COMMON /INPJET/
     * DIAJ,MJET,TJET,PTJET,VJET,TIJET,PE,VE,ME,TIE,
     * TE,AXI,NDUM(2) ,
     *  X(100),DUMI2(101),  RG  , DUMI3(5)
      LOGICAL  AXI
      REAL  ME,MJET
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
      COMMON /BC/ UEDGE,EEDGE,THEDGE
      COMMON /CTRL/ NXTA,DUMC1(10),C8,DUMC2(2),NPU,NPD,DUMC3(803)
      COMMON /PROPJT/ PP,DUM90(12), RHO(200),MUL(200),DUM91(1000)
      REAL MUL
C*
      COMMON /CQIREM/  TOLP,EKRO,DEDP,CTRMAX
      DIMENSION  QV(8)
      EQUIVALENCE  (IUP,UPSTRM)
      EQUIVALENCE  (CMPRS,DUMC1(1))
      LOGICAL  CMPRS
C*
C*  INITIALIZE ON  1- ST ENTRY
C*
    1 IF(.NOT. ENTRY1)  GO TO 10
      ITKX=.FALSE.
      C8=DIAJ*VJET/FOOT
      P1=PE
      P2=PE
      PLIM=.9999999*PTE
      MXFAIL=10
      MXF=0
```

```
      DPDX2=0.
      GAM=GAMH(TE)
      TOLP=TOL
      PJMP=.01*PE
      IF(MJET.GE.1. .AND. ME.GE. 1.)  PJMP=-PJMP/5.
      IF(ME.LE. .1) PJMP=EXP(64.*ME-11.515)
      TOLP=TOL
      EKRO=0.
      DEDP=-1.E-6
      MXT=MAXIT/2
      XNUM=FLOAT(MAXIT)
      CTRMAX=AMAX1(XNUM,0.)
      NIT=0
      QV(1)=0.
      CVG=.FALSE.
      CALL LCFIT(XD,YR,NXORIG,0,XX*DIAJ,YDD,1,0,CLSP)
      PJMPA=.5*PJMP
C*
   10 KGO   = 1
      IF( UPSTRM ) KGO=2
      IF(.NOT. CMPRS)  KGO=3
      IF(.NOT. CVG)  GO TO 20
C*
C*  CONVERGED SOLUTION-- RESET-- EXTRAPOLATE INITIAL TRIAL P2
C*
   15 DPDX2=(P2-P1)/DXX
      P1=P2
      PP=P1
      P2=P1+DPDX2*DXX
      IF(NIT.GE.12)  PJMP=.1*PJMP
      NIT=0
      CVG=.FALSE.
      QV(1)=0.
      IF(CHOKE)  CHOKE=.FALSE.
      CALL LCFIT(XD,YR,NXORIG,0,XX*DIAJ,YDD,1,0,CLSP)
      GO TO 21
C*
   20 DPDX2=(P2-P1)/DXX
   21 GO TO  (40,30,60)  ,  KGO
C*
C*  UPSTRM=T-- ITERATE ISENTROPIC PARAMETERS
C*
   30 PRAT=PTE/P2
      ASSIGN  32 TO MGO
      IK=0
   31 GAM1=(GAM-1.)/GAM
      GAM2=.5*(GAM-1.)
      MACH2=SQRT(1./GAM2*(PRAT**GAM1-1.))
      TS2=TTE/(1.+GAM2*MACH2**2)
      GO TO  MGO , (32,34)
C*
   32 GAMC=GAMH(TS2)
      DGAM=ABS(GAM-GAMC)
      GAM=GAMC
      IK=IK+1
      IF(DGAM.LE.  (.001)  .OR.  IK.GT.10) GO TO 36
```

```
      GO TO 31
   36 ASSIGN  34 TO MGO
      GO TO 31
C*
   34 SS2=SQRT(GAM*GC*RG*TS2)
      V2=MACH2*SS2
      TW=TS2
      RHO2=144.*P2/(RG*TS2)
C*
C*  SET B.C.  AT EDGE OF JET
C*
      UEDGE=V2/VJET
      THEDGE=TS2/TJET
      GO TO  50
C*
C*  INCOMPRESSIBLE BRANCH
C*
   60 IF(.NOT. UPSTRM)  GO TO 40
      TS2=TE
      RHO2=144.*P2/(RG*TS2)
      V2=SQRT((PTE/P2-1.)*2.*GC*RG*TS2)
      UEDGE=V2/VJET

      THEDGE=TS2/TJET
      GO TO 50
C*
C*  UPSTRM=F-- CALCULATE  B.   AT DUCT WALL
C*
C*
C*  IMPOSE ZERO GRADIENT CONDITIONS AT EDGE OF BL
C*
   40 GRADU=0.
C*
   50 RETURN
C*
C*
C* ****************    ENTRY  AITER2-- NEW TRIAL VALUE OF P2
C*
      ENTRY  AITER2
C*
C*  COMPUTE -- YDC
C*
      IF(.NOT.  UPSTRM)  GO TO 120
C*
C*  COMPUTE  DELYE FOR UNENTRAINED FLOW-- ADD TO YE
C*
  110 DELYE=2.*(PSID-SFE)/(RHO2*UEDGE)
      IF(DELYE.LT.0.)  DELYE=0.
      IF(AXI)  GO TO 111
      YDC=YE+DELYE
      GO TO 130
  111 YDC=SQRT(YE**2+2.*DELYE)
      GO TO 130
C*
C*  UPSTRM=F---- JET HAS INTERSECTED WALL
C*
```

```
  120 YDC=YE
C*
C*  COMPUTE  RELATIVE ERROR IN FLOW BALANCE
C*
  130 ERK=YDD/YDC-1.
C*
C*  RESET PJMP IF NECESSARY
C*
C*
C*  RESET PJMP IF NECESSARY FOR SUPERSONIC BRANCH
C*
      IF(SUPB .AND. CHOKED  .AND.  PJMP.GT.0.)  PJMP=-PJMP
      IF(UPSTRM .AND. MACH2.LE. .1 ) PJMP=EXP(64.*MACH2-11.515)
      PSV=P2
C*
C*  CALL QIREM FOR NEW VALUE OF P2
C*
  135 CALL QIREM(P2,ERK,PJMP,QV)
      IF(UPSTRM)  P2=AMIN1(P2,PLIM)
      IF(UPSTRM) PJMPS=PJMP
      IF(P2.EQ.PSV) QV(1)=0.
C*
C*  TEST FOR CONVERGENCE
C*
  136 IF(QV(1).EQ.0.)  GO TO 150
C*
C*  TEST FOR CONVERGENCE ON CHOKE VALUE
C*
  140 IF(QV(5).NE.0.)  GO TO 160
C*
C*  SET CHOKE INDICATOR
C*
      CHOKED=.TRUE.
      CHOKE=.TRUE.
  150 CVG=.TRUE.
      IF(UPSTRM) GO TO 151
      V2=VJET*UD(NPD)
      TS2=TJET*THD(NPD)
      GAM=GAMH(TS2)
      MACH2=V2/SQRT(GAM*RG*GC*TS2)
  151 PP=P2
      IF((UPSTRM.AND.YE.GE.YDD) .OR. (UPSTRM.AND.DELYE.EQ. 0.))
     * UPSTRM=.FALSE.
      GO TO 200
C*
  160 NIT=NIT+1
      IF(NIT.GE. MXT)  ITKX=.TRUE.
      IF(NIT.LT.MAXIT) GO TO 200
      MXF=MXF+1
C*
C*  TEST FOR NON-CONVERGENCE ON YE.GT.YDD
C*
      IF((UPSTRM.AND.YE.GT.YDD) .OR. (MXF.LE.MXFAIL)) GO TO 150
      ERR=.TRUE.
C*
  200 IF(.NOT. UPSTRM) PJMP=100.*PJMPS
```

```
      IF(PM(6).NE.0. .OR.ITKX .OR.P2.EQ.PLIM) GO TO 201
      RETURN
  201 ITKX=.FALSE.
      WRITE  (6,250) NIT,XX,YDD,YDC,P2,ERK,CHOKE,UPSTRM
  250 FORMAT(/2X,11HITERATION   ,I2//5X,1HX,10X,3HYDD,9X,3HYDC,
     * 10X,2HP2,9X,3HERK,7X,5HCHOKE,7X,6HUPSTRM/1X,5E12.5,2L12/)
      WRITE  (6,251) QV
  251 FORMAT(/1X,11HQIRE VECTOR,1X,F4.0,7E16.8/)
      WRITE  (6,252) GAM,MACH2,V2,TS2,RHO2,YE,SFE
  252 FORMAT(5X,3HGAM,7X,5HMACH2,10X,2HV2,10X,2HT2,8X,
     * 4HRHO2,8X,2HYE,7X,3HSFE/1X,7F12.5)
  260 RETURN
      END

*DECK DERIV
      SUBROUTINE DERIV(Y,F,DFDY,J1,J2)
CDERIV          DFEQ COMPATIBLE DERIVATIVE
      DIMENSION  Y(2),F(2),DFDY(2)
      DENOM(A,B,C)=(A-B)*(A-B)*(C-A)+(C-A)*(C-A)*(A-B)
    1 DO 10 J=J1,J2
      DELA2=Y(J)-Y(J-1)
      DELB2=Y(J+1)-Y(J)
      DDD=1./DENOM(Y(J),Y(J-1),Y(J+1))
      DFDY(J)=(DELA2*DELA2*(F(J+1)-F(J))+DELB2*DELB2*(F(J)-F(J-1)))*DDD
   10 CONTINUE
   11 RETURN
      END
```

```
*DECK DFEQ
      SUBROUTINE DFEQ(NDIFF,NBCL,NBCU,IERIND)
CDFEQ         GEN. ROUTINE-DIFFUSION EQUATION EQN--CENTERED/NON CENTERED
      LOGICAL FIRST
C*
C*
C*  PDEQ--   EPSLN*(DF/DX)=ALPHA*D(BETA*(DF/DPHI))/DPHI+GAMMA+DLTA*F
C*               +ETA*(DF/DPHI)
C*  FMI=SOLUTION VECTOR--PREVIOUS STATION DESTROYED BY CURRENT STATION
C*  DFM1=  DERIVATIVE VECTOR
C*  ALPHA,BETA,GAMMA,DLTA,EPSLN,ETA--COEFFICIENTS IN PDEQ
C*  DELM1,DELM=  NORMAL STEP SIZES AT PREVIOUS AND CURRENT STATIONS
C*  DELX=  AXIAL STEP SIZE
C*  B1,C1,D1,AN,BN,DN=  BOUNDARY COEFFICIENTS
C
C*  USES NON CENTERED 3-POINT DIFFERENCES
C*
C*
C*  STANDARD IMPLICIT FORM
C*
C*
C*  BRANCH FOR DISCONTINUOUS FUNCTION FORM REQUIRES INTERPOLATION
C*  AT EACH MESH POINT....
C*
C*
C*  NBC--NORMAL BC INDICATOR--L=LOWER,U=UPPER
C*       =0 BACKWARD DIFFERENCE
C*       =1 USE TWO POINTS ABOVE OR BELOW BOUNDARY
C*    EXTRA COEFFICIENTS STORED IN CARRY(1,1) AND/OR CARRY(3,NM)
C*       =2  USE B.C. WHICH SATISFY DIFFERENTIAL EQUATION
C*
C*
C*  NDIFF--INDICATES DIFFERENCE FORM FOR D(BETA*DF/DPHI)/DPHI
C*        =0   EXPAND 2-ND DERIVATIVE
C*        =1   USE FORM APPLICABLE FOR DISCONTINUOUS FUNCTIONS
C*
      COMMON /PARAM/
     * ALPHA(200) , BETA(200)   , GAMMA(200) ,
     * EPSLN(200)  , DLTA(200)   ,
     * FM1(200)    , DFM1(200)   ,
     * PHI1(200)   , NM1          , PHI2(200) , NM
     * DX    ,
     * B1    , C1    , D1
     * AN    , BN    , DN
      COMMON /PARAM1/  ETA(200)
      COMMON /YOFXI/ NLC
      EQUIVALENCE (PHI(1),PHI2(1))
      DIMENSION CARRY(200,4)
      DIMENSION PHI(200)
      DENOM(AA,BB,CC)=(AA-BB)*(AA-BB)*(CC-AA)+(CC-AA)*(CC-AA)*(AA-BB)
C*
      DATA FIRST/T/,NUM/200/
C*
    1 IERIND=0
      IF(DX.EQ.0.) DX=1.
      NGOL=NBCL+1
```

```
      NGOU=NBCU+1
      NDF=NDIFF+1
      IF(PHI2(NM).LE.PHI1(NM1)) GO TO 10
C*
C*  ADD POINTS TO PREVIOUS STATION TO ACCOUNT FOR MESH SPREADING
C*
      DELM1=PHI1(NM1)-PHI1(NM1-1)
      DELTA=PHI2(NM)-PHI1(NM1)
      NEND=2+IFIX(DELTA/DELM1)+NM1
      J=NM1+1
    5 PHI1(J)=PHI1(J-1)+DELM1
      ALPHA(J)=ALPHA(NM1)
      BETA(J)=BETA(NM1)
      GAMMA(J)=GAMMA(NM1)
      EPSLN(J)=EPSLN(NM1)
      DLTA(J)=DLTA(NM1)
      ETA(J)=ETA(NM1)
    6 FM1(J)=FM1(NM1)
      J=J+1
      IF(J .LE. NEND) GO TO 5
      NM1=NEND
C*
   10 NMM1=NM-1
C*
C*  CONSTRUCT COEFFICIENT ARRAY FOR NODES 2 TO (NMM1)
C*  DELTA-S AT EACH STATION ARE SAME, BYPASS INTERPOLATION SECTION
C*
   12 J=1
   13 J=J+1
      DEL1=PHI1(J)-PHI1(J-1)
      DEL2=PHI1(J+1)-PHI1(J)
      DEL3=PHI2(J)-PHI2(J-1)
      DEL4=PHI2(J+1)-PHI2(J)
      Y=PHI2(J)
      DEL34=DEL3+DEL4
      DEL3SQ=DEL3*DEL3
      DEL4SQ=DEL4*DEL4
      ASSIGN 21 TO KGO
      IF(DEL1.EQ.DEL3 .AND. DEL2.EQ.DEL4) GO TO 19
      ASSIGN 37 TO KGO
C*
C*  LINEAR INTERPOLATION FOR ALP,GAM,FM2,EPS,BETA   ETC
C*
      NLC=1
   14 ALP=YOF(Y,PHI1,ALPHA,1,NM1)
      GAM=YOF(Y,PHI1,GAMMA,1,NM1)
      FM2=YOF(Y,PHI1,FM1  ,1,NM1)
      EPS=YOF(Y,PHI1,EPSLN,1,NM1)
      DLTA1=YOF(Y,PHI1,DLTA,1,NM1)
      ETA1=YOF(Y,PHI1,ETA,1,NM1)
      GO TO (15,16),NDF
   15 W=Y+DEL4
      Z=Y-DEL3
      BETL=YOF(Z,PHI1,BETA,1,NM1)
      BET =YOF(Y,PHI1,BETA,1,NM1)
      BETU=YOF(W,PHI1,BETA,1,NM1)
```

```
      GO TO 30
C*
C*  DISCONTINUOUS FUNCTION(BETA*DF/DPHI) BRANCH
C*
   19 GO TO (20,16),NDF
   16 W=Y+.5*DEL4
      Z=Y-.5*DEL3
      NLC=1
      BMHALF=YOF(Z,PHI1,BETA,1,NM1)
      EMHALF=YOF(Z,PHI1,ETA,1,NM1)
      BPHALF=YOF(W,PHI1,BETA,1,NM1)
      EPHALF=YOF(W,PHI1,ETA,1,NM1)
      IF(J.NE. 2) GO TO 161
      BSV=BMHALF
      ESV=EMHALF
  161 IF(J.NE. NMM1) GO TO 20
      BSVU=BPHALF
      ESVU=EPHALF
   20 GO TO KGO , (21,37)
   21 ALP=ALPHA(J)
      GAM=GAMMA(J)
      EPS=EPSLN(J)
      DLTA1=DLTA(J)
      ETA1=ETA(J)
      FM2=FM1(J)
      IF(NDF.EQ.2) GO TO 37
C*
C*  EXPANDED 2-ND DERIVATIVE BRANCH----
C*  D(BETA*DF/DPHI)/DPHI=DBETA/DPHI*DF/DPHI+BETA*D2F/DPHI2
C*
      BET=BETA(J)
      BETU=BETA(J+1)
      BETL=BETA(J-1)
   30 DD=1./DENOM(PHI2(J),PHI2(J-1),PHI2(J+1))
      DBETA=(DEL3SQ*(BETU-BET)+DEL4SQ*(BET-BETL))*DD
   32 TSV=ALP*DX*DD
      TL=2.*TSV*BET
      TM=TSV*DBETA
      TN=GAM*DX
      TK=ETA1*DX*DD
      TMK=TK+TM
C*
   35 CARRY(J,1)=TMK*DEL4SQ-TL*DEL4
      CARRY(J,2)=EPS+TL*DEL34+TMK*(DEL3SQ-DEL4SQ)
     * -DLTA1*DX
      CARRY(J,3)=-TMK*DEL3SQ-TL*DEL3
      CARRY(J,4)=EPS*FM2+TN
      GO TO 39
C*
   37 TSV=2.*ALP*DX/DEL34
      TL=TSV*BPHALF/DEL4
      TM=TSV*BMHALF/DEL3
      TN=GAM*DX
      TKM=.5*EMHALF/DEL3
      TKP=.5*EPHALF/DEL4
      CARRY(J,1)=-TM+TKM
```

```
      CARRY(J,2)=EPS+TM+TL-DLTA1*DX+TKP-TKM
      CARRY(J,3)=-TL-TKP
      CARRY(J,4)=EPS*FM2+TN
   39 IF(J.LT.NMM1) GO TO 13
C*
C*  STORE UPPER AND LOWER B.C. IN CARRY
C*
      DELT1=PHI(2)-PHI(1)
      GO TO (40,46,400),NGOL
C*
   40 CARRY(1,1)=0.
      CARRY(1,2)=B1-C1/DELT1
      CARRY(1,3)=C1/DELT1
      CARRY(1,4)=D1
      GO TO 47
C*
   46 CARRY(1,1)=-C1*PHI(2)/(PHI(3)*(PHI(3)-PHI(2)))
      CARRY(1,2)=B1-(PHI(2)+PHI(3))/(PHI(2)*PHI(3))*C1
      CARRY(1,3)=-CARRY(1,1)*PHI(3)**2/PHI(2)**2
      CARRY(1,4)=D1
      GO TO 47
C*
  400 DELT2=1./DELT1
      DELT1S=DELT2**2
      CARRY(1,1)=0.
      TERM=2.*C1*ALPHA(1)*BSV*DELT1S
      TERM2=2.*D1*ALPHA(1)*DELT2
      CARRY(1,2)=2.*B1*ALPHA(1)*DELT2-TERM-C1*EPSLN(1)/DX
     * +C1*DLTA(1)-C1*ESV*DELT1
      CARRY(1,3)=TERM+C1*ESV*DELT1
      CARRY(1,4)=-C1*(GAMMA(1)+FM1(1)*EPSLN(1)/DX)+TERM2
   47 DELTN=PHI(NM)-PHI(NMM1)
      GO TO (48,49,410),NGOU
C*
   48 CARRY(NM,1)=-BN/DELTN
      CARRY(NM,2)=AN+BN/DELTN
      CARRY(NM,3)=0.
      CARRY(NM,4)=DN
      GO TO 50
C*
   49 PHIM1=PHI(NMM1)*PHI(NMM1)
      PHIM2=PHI(NM-2)*PHI(NM-2)
      ZTA=(2.*PHI(NM)*PHI(NMM1)-PHIM1)/
     * (PHIM2+2.*PHI(NM)*(PHI(NMM1)-PHI(NM-2))-PHIM1)
      DEN=1./((1.-ZTA)*PHI(NMM1)+ZTA*PHI(NM-2))
      CARRY(NM,1)=(1.-ZTA)*BN*DEN
      CARRY(NM,2)=AN-BN*DEN
     * -BN*DLTA(NM)
      CARRY(NM,3)=ZTA*BN*DEN
      CARRY(NM,4)=DN
      GO TO 50
C*
  410 DELT1=1./(PHI(NM)-PHI(NMM1))
      DELT1S=DELT1**2
      TERM=-2.*BN*ALPHA(NM)*BSVU*DELT1S
      TERM2=2.*DN*ALPHA(NM)*DELT1
```

```
      CARRY(NM,1)=TERM+BN*ESVU*DELT1
      CARRY(NM,2)=2.*AN*ALPHA(NM)*DELT1+BN*EPSLN(NM)/DX-TERM
     * -BN*ESVU*DELT1
      CARRY(NM,3)=0.
      CARRY(NM,4)=BN*(GAMMA(NM)+EPSLN(NM)*FM1(NM)/DX)+TERM2
C*
C*  CALL TDSEQ FOR SOLUTION TO SIMULTANEOUS EQUATIONS.
C*
C*
C*
   50 CALL TDSEQ(CARRY,NM,NUM,ERR)
      IF( ERR.GT.0. ) IERIND=1
C*
C*  STORE SOLUTION IN FM1 AND COMPUTE DF/DPHI
C*
      FM1(1)=CARRY(1,1)
      FM1(NM)=CARRY(NM,1)
      DELT1=PHI(2)-PHI(1)
      DELTN=PHI(NM)-PHI(NMM1)
      IF(B1 .EQ.0. .AND. D1.EQ.0.) DFM1(1)=0.
      IF(AN .EQ. 0. .AND. DN.EQ.0.) DFM1(NM)=0.
      J=2
   61 FM1(J)=CARRY(J,1)
      FM1(J+1)=CARRY(J+1,1)
      DELA2=PHI(J)-PHI(J-1)
      DELB2=PHI(J+1)-PHI(J)
      DDD=1./DENOM(PHI2(J),PHI2(J-1),PHI2(J+1))
      DFM1(J)=(DELA2*DELA2*(FM1(J+1)-FM1(J))+DELB2*DELB2
     * *(FM1(J)-FM1(J-1)))*DDD
      J=J+1
      IF(J.LE.NMM1) GO TO 61
      DFM1(1)=(FM1(2)-FM1(1))/DELT1
      DFM1(NM)=(FM1(NM)-FM1(NMM1))/DELTN
C*
C*
C*
      NM1=NM
  100 RETURN
      END
```

```
*DECK JMESHM
      SUBROUTINE JMESHM
CJMESHM         MESH REDISTRIBUTION FOR TRANS. REGION
      COMMON /PARAM/ DUM(1601),SM(200),NM,DUM1(7)
      COMMON /CTRL/ DUM2(15), NPD, DUM3(803)
      COMMON /UMESH/ MCHANG,CK,DY1,NMSH        CXPC,CXTP,NRED
C*
C*
    1 PSIE=SM(NPD)
      DPSIF=DY1*PSIE
      CK1=CK-1.
      CON=DPSIF/CK1
      DO 5 L=1,NMSH
      EXP=FLOAT(L-1)
    5 SM(L)=CON*(CK**EXP-1.)
      NPD=NMSH
   10 RETURN
      END
```

```
*DECK JTCTRL
      SUBROUTINE JTCTRL
CJTCTRL          MAIN JET CONTROL ROUTINE
      LOGICAL SUPC,SUPSTP
      LOGICAL MCHANG
      LOGICAL CORSTP
      LOGICAL BYPASS
      LOGICAL  EOF   ,  ERR
      LOGICAL AXI,CMPRS,QJET,TURBJ,CORE
      INTEGER XFRN
      REAL  MJET , ME , MUREF
      COMMON /RSTART/ NREG,RESTRT,NRES,MIXPRE
      LOGICAL  MIXPRE
C*
    * COMMON /JDI*00/ , MJETO   , TJETO  , VJETO  ,
     * PTJETO , TIJETO , NJO
      REAL  MJETO,MACHO
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI    , MERGE  , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI  , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ        , MJET        , TJET        , PTJET       , VJET        ,
     * TIJET       ,
     * PE          , VE          , ME          , TIE         , TE          ,
     * AXI         , NJ          , NMAX        ,
     * X(100)      , XPRN(100)   ,
     * GAM         , RG          , PR          , PRT         ,
     * SC          , TREF        , MUREF
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA        , CMPRS       , QJET        , TURBJ       , COEF(10)    ,
     * NPU         , NPD         , DXC         , XU          , XD          ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
```

```
      COMMON /CORED/ XCORE  , CORE  , CORSTP
      COMMON /SUPER/ SUPC,SUPSTP,XSUP
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP  , SV  , SLEN
C*
C****** JET PROPERTIES COMMON
C*
      COMMON /JET/
     * R(100)   , UC(100)  , TC(100)  , TIC(100) ,
     * PTC(100) , WJ(100)  , YJ(100)  ,
     * YSONIC(100)
      COMMON /JET1/ FLOWJ, TTO, NXN , EJET
      COMMON /JET2/  TTC(100)
      COMMON /UMESH/ MCHANG,CK,DY1,NMSH      , CXPC,CXTP,NRED
      COMMON /JET3/ STADD, NV, STATF
      LOGICAL  STADD,STATF
      COMMON /MIXER/ MIX,RD(100),ZD(100),CF,YR(100)
      LOGICAL  MIX
      DATA BYPASS/F/
C*
C*  INITIALIZE AT FIRST STATION--INCLUDE STATION WHERE CORE
C*  DISAPPEARS AS A CALCULATION STATION TO BE INSERTED
C*
      NCALC=NXTA
    1 CORE=.FALSE.
      SUPC=.FALSE.
      MER=.FALSE.
      NXP=NRES
      NXN=NXP+1
      XU=X(NXP)
      IF(.NOT. MIX)  GO TO 2
      NV=2
      STADD=.FALSE.
      STATF=.FALSE.
    2 XD=X(NXN)
      DXC=XD-XU
C*
C*  CALL JTSTEP FOR INTEGRATION TO NEXT CALCULATION STATION
C*
    3 CALL JTSTEP
      IF(ERR) GO TO 1000
C*
C*  TEST FOR DISAPPEARANCE OF POTENTIAL CORE
C*
C*
C*  ALSO TEST FOR DISAPPEARANCE OF SUPERSONIC CORE IF JET IS SUPERSONIC
C*
      IF(CORE .AND. CORSTP) GO TO 5
      IF(SUPC .AND. SUPSTP) GO TO 5
      IF(MER .AND. MERSTP)    GO TO 5
      GO TO 20
C*
C*  RELOCATE JET PROPERTIES UP 1 LOCATION--
C*  INSERT XDCORE AND SET XPRN T
```

```
C*
    5 ASSIGN 9 TO LGO
      XTEST = X(NXN)
      IF( (XTEST.NE.XCORE).AND.(XTEST.NE.XSUP).AND.(XTEST.NE.XMRG) )
     * GO TO 501
      ASSIGN 15 TO LGO
      GO TO 8
  501 NM     = -(NXTA-NXN+1)
      N1=NXN+1
      CALL MOVE(5,X(NXN),X(N1),NM,1,B(NXN),B(N1),NM,1,
     * TTC(NXN),TTC(N1),NM,1,XPRN(NXN),XPRN(N1),NM,1,
     * YSONIC(NXN),YSONIC(N1),NM,1)
      CALL MOVE(5,YJ(NXN),YJ(N1),NM,1, UC(NXN),UC(N1),NM,1,
     * TC(NXN),TC(N1),NM,1,PTC(NXN),PTC(N1),NM,1,TIC(NXN),TIC(N1),NM,1)
      CALL MOVE(1,WJ(NXN),WJ(N1),NM,1)
    6 IF(CORE) X(NXN)=XCORE
      IF(SUPC) X(NXN)=XSUP
      IF(MER)  X(NXN)=XMRG
    7 XPRN(NXN)= 1
    8 IF( CORE ) CORE=.FALSE.
      IF(SUPC) SUPC=.FALSE.
      IF(MER)  MER=.FALSE.
      GO TO LGO , (9,15)
    9 NCALC = NCALC+1
      NXTA=NXTA+1
C*
C*  COMPUTE JET PROPERTIES
C*
   15 IF(MIX) STADD=.TRUE.
   20 CALL JETPRP
   21 IF(ERR) GO TO 1000
C*
C*  PRINT PROFILES IF REQUESTED
C*
   30 IF( XPRN(NXN).NE.0 ) CALL JTOUTP
C*
C*  IF CORSTP=T, REDISTRIBUTE MESH AFTER DISAPPEARANCE
C*  OF POTENTIAL CORE
C*
   40 IF(.NOT. CORSTP) GO TO 50
      IF(BYPASS) GO TO 50
      IF(MCHANG) CALL JMESHM
      BYPASS=.TRUE.
C*
C*  INCREMENT COUNTERS,,,    TEST FOR END OF PROBLEM
C*
   50 NXN=NXN+1
      NXP=NXP+1
      IF(NXN.GT. NCALC) GO TO 1000
      IF(MIX .AND. STATF)  GO TO 1000
      IF(.NOT. STADD)  NV=NV+1
      IF(MIX)  STADD=.FALSE.
C*
C*  CONTINUE INTEGRATION
C*
  100 XU=XD
```

```
      GO TO 2
C*
 1000 RETURN
      END
```

```
*DECK JTEDGE
      SUBROUTINE JTEDGE(X,YE,PSIE,ADDP)
CJTEDGE          LOCATE EDGE OF JET        NEW Y CO-ORDINATES
      LOGICAL HALF
      LOGICAL AXI
      COMMON /JETTWO/
     * TWO    , DIAO   , MJETO  , TJETO  , VJETO  ,
     * PTJETO , TIJETO , NJO
      REAL  MJETO,MACHO
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI    , MERGE  , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI  , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      COMMON /PROPJ2/  MACHO,REFLO,YII,YO,MERGP
      LOGICAL MERGP
      LOGICAL  TWO, MERGE , MER , MERSTP
      COMMON /MISC/ PM(10)
      LOGICAL ADDP
      COMMON /SETNEW/  LKK,LCOR
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
      COMMON /YOFXI/ LE1
      COMMON /INPJET/ DIAJ,MJET,TJET,DUMI1(7),TE,AXI,DUMI2(203),RG
      COMMON /BC/ UEDGE,EEDGE,THEDGE
      COMMON /PROPJT/ P,DUMPR(1412)
      COMMON /PARAM/ UDIF(200),PSI1(200),DUMP(1201),SM(200),NM,
     * DUMP1(7)
      COMMON /ERASE/  DUME(800)
      COMMON /CTRL/ DUMC1(15), NPD  , DUMC2(803)
      COMMON /XPRIN/ DPRIN
C*
C*  AITER1-- COMPUTE B.C. FOR NEXT TRIAL AT MASS BALANCE
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /CNERR/ BITS,ERR,GC,GCJ,FOOT
      LOGICAL ERR
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /OUTMIX/ NXORIG
C*
      LOGICAL DPRIN
      DIMENSION STORI(200)
      EQUIVALENCE (STORI(1),DUMP(1))
      DIMENSION YI(200),RHO(200)
      EQUIVALENCE (YI(1),DUMP(201)),(  RHO(1),DUMP(401))
      DATA LFFF/200/
```

```
C*
C*
C*  IF HALF=.TRUE. EDGE IS TAKEN AT 50 PCT VELOCITY LINE  (Y102)
*
      ADDP=.FALSE.
      HALF=.FALSE.
      IF(PM(4).NE.0.) HALF=.TRUE.
C*
C*  CHECK JET UD FOR 1-ST POINT WHERE UD=UEDGE
C*  REDEFINE JET EDGE CONDITIONS
      DO 6620 L=1,NPD
      IF(UD(L).EQ.UEDGE  .AND. UEDGE.EQ. 0.)  GO TO 6621
 6620 CONTINUE
 6621 NPD=L
      IF((.NOT. MIX)  .OR.  (MIX .AND. UPSTRM))  THD(NPD)=THEDGE
      IF((.NOT. MIX)  .OR.  (MIX .AND. UPSTRM))   ED(NPD)=EEDGE
      NPD1=NPD-1
      DIFEU=ABS(UEDGE-UD(NPD-1))
      IF(.NOT. MIX) GO TO 1
      DO 6720 L=1,NPD
 6720 RHO(L)=144.*P2/(RG*THD(L)*TJET)
      LE1=NPD
      LE=LE1-1
      PSIE=SM(LE1)
      RHOE=RHO(LE1)
      UEE=UD(LE1)
      GO TO 468
C*
C*
C*  LOCATE EDGE(S) OF JET(S)
C*  -- POINT WHERE VELOCITY DIFFERENCE IS  .98*MAX. VELOCITY
C*  DIFFERENCE ACROSS THE JET
C*
C*
    1 UCL1=UD(1)
      LK=1
      DO 2 L=1,NPD
      UDIF(L)=ABS(UD(L)-UCL1)
      IF(L.EQ.1)  GO TO 2
      TESTA=UD(L-1)+1.E-6
      TESTB=UD(L-1)-1.E-6
      IF(UD(L).GE.TESTB .AND. UD(L).LE.TESTA .AND. L.LT.LFFF) LK=L
    2 RHO(L)=144.*P/(RG*THD(L)*TJET)
      TESTE=AMAX1(.98,PM(3))
      ULIM=TESTE*ABS(UEDGE-UCL1)
      IF(HALF) ULIM=.5*ABS(UEDGE-UD(1))
      LFFF=LK
      IF(DPRIN)  CALL TABPRT(2HLK,LK,1,1,0)
      IF(DPRIN) CALL TABPRT(4HUDIF,UDIF,NPD,10,0)
C*
C*
C****      LOCATE OUTER STREAMLINE     * ********
C*
C*  FOR OUTER STREAMLINE-- CHOOSE THE MINIMUM OF INTERPOLATED
C*      AND EXTRAPOLATED VALUES
C*
```

```
      LE1=0
      DO 300 L=LK,NPD
      IF(UDIF(L).GE. ULIM)  GO TO 301
  300 CONTINUE
  301 LE1=L
      LE=LE1-1
      SLOPED=(SM(LE1)-SM(LE))/(UDIF(LE1)-UDIF(LE))
      PSIE1=SM(LE)+SLOPED*(ULIM-UDIF(LE))
      IF(.NOT. HALF) GO TO 6
      PSIE=PSIE1
      GO TO 8
    6 LEE=LE1-2
      SLOPEE=(SM(LE)-SM(LEE))/(UDIF(LE)-UDIF(LEE))
      PSIE2=SM(LE)+SLOPEE*(ULIM-UDIF(LE))
      PSIE=AMIN1(PSIE1,PSIE2)
    8 LJ=LK-1
      UEE=YOF(PSIE,SM,UD,LJ,NPD)
      RHOE=YOF(PSIE,SM,RHO,LJ,NPD)
  468 DO 4 L=1,LE
    4 STORI(L)=2./(RHO(L)*UD(L))
      STORI(LE1)=2./(RHOE*UEE)
C*
C*
C*  MOVE PSI ARRAY TO SCRATCH--STORAGE
C*
      CALL MOVE(1,SM,PSI1,LE,1)
C*
C*  INSERT EDGE STREAMLINE
C*
      PSI1(LE1)=PSIE
C*
C*  DETERMINE Y- COORDINATES BY INTEGRATION OF STREAM FUNCTION
C*
C*
C*  USE TRAPEZOIDAL RULE
C*
      YI(1)=0.
      YCB1=0.
      IF(.NOT. MIX)  GO TO 399
      CALL LCFIT(XD,YCB,NXORIG,0,X*DIAJ,YI(1),1,0,CLSPCB)
      YCB1=YI(1)
      IF(AXI) YI(1)=0.
  399 CALL INTG(STORI,PSI1,YI,2,LE1)
      YE=YI(LE1)
      YSV=YE
      IF(AXI) YE=SQRT(YCB1**2+2.*YE)
C*  MOVE YI VALUES TO Y ARRAY
C*
      LX=LE
      IF(MIX) LX=LE1
   40 CALL MOVE(1,YI,Y,LX,1)
      IF(MIX) GO TO 8888
C*
C*  CONTINUE INTEGRATION TO NPD-1
C*  EXTRAPOLATE FOR NPD POINT
C*
```

```
      NPD1=NPD-1
      MX=1
      IF(NPD1.EQ. LE)  MX=2
      IF(NPD1.EQ. LE)  GO TO  887
      DO 42 L=LE1,NPD1
   42 STORI(L)=2./(RHO(L)*UD(L))
      CALL INTG(STORI,SM,Y,LE1,NPD1)
  887 IF(UEDGE .GT. 0.)  GO TO 8887
      GO TO (888,889), MX
C 888 SLOPE=(Y(NPD1)-Y(NPD1-1))/(UDIF(NPD1)-UDIF(NPD1-1))
C     Y(NPD)=Y(NPD1)+SLOPE*(UDIF(NPD)-UDIF(NPD1))
  888 SLOPE=(Y(NPD1)-Y(NPD1-1))/(SM(NPD1)-SM(NPD1-1))
      Y(NPD)=Y(NPD1)+SLOPE*(SM(NPD)-SM(NPD1))
      GO TO  8888
C 889 SLOPE=(YSV-Y(NPD1))/(ULIM-UDIF(NPD1))
C     Y(NPD)=YSV+SLOPE*(UDIF(NPD)-ULIM)
  889 SLOPE=(YSV-Y(NPD1))/(PSIE-SM(NPD1))
      Y(NPD)=YSV+SLOPE*(SM(NPD)-PSIE)
      GO TO 8888
 8887 STORI(NPD)=2./(RHO(NPD)*UD(NPD))
      CALL INTG(STORI,SM,Y,NPD,NPD)
 8888 Y(1)=YCB1
      IF(.NOT. AXI)  GO TO 3811
      IF(.NOT.DPRIN) GO TO 19
      CALL TABPRT(4HPSI1,PSI1,LE,10,0)
      CALL TABPRT(4HY(L),Y,NPD,10,0)
      CALL TABPRT(5HYI(L),YI,LE,10,0)
      CALL TABPRT(5HSTORI,STORI,LE,10,0)
      WRITE(6,107)PM(4),UEDGE,ULIM,PSIE,NPD,NPD1,LE1,LE,MX,HALF,MIX,YCB1
  107 FORMAT(1X//
     1 2X,8HPM(4)   =,E14.6,2X,8HUEDGE   =,E14.6,2X,8HULIM    =,E14.6,2X,
     2 8HPSIE    =,E14.6//
     3 2X,8HNPD     =,I6,10X,8HNPD1    =,I6,10X,8HLE1     =,I6,10X,
     4 8HLE      =,I6//
     5 2X,8HMX      =,I6,10X,8HHALF    =,L6,10X,8HMIX     =,L6,10X,
     6 8HYCB1    =,E14.6)
   19 CONTINUE
      DO 7 L=2,NPD
    7 Y(L)=SQRT(YCB1**2+2.*Y(L))
 3811 CONTINUE
C*
C*  DETERMINE IF NEW POINT IS TO BE ADDED
C*
C*
C*  IF TWO=T  AND MERGE=F,  LOCATE BOUNDARY OF INNER JET
C*
      IF(MERGE .OR.  (.NOT. TWO)) GO TO 30
      ULIML=TESTE*ABS(U0-1.)
      TEST2=U0+1.E-6
      TEST1=U0-1.E-6
C*
C*  LOCATE NEAREST MESH POINT
C*
      DO 200 L=1,NPD
      IF(UD(L).LE.TEST2  .AND.  UD(L).GE. TEST1)  UD(L)=U0
      IF(UD(L) .EQ.  U0)  GO TO 259
```

```
  200 CONTINUE
C*
C*   ASSUME JETS HAVE MERGED-- SET CO-ORDINATES OF MERGE POINT
C*
      MERGE=.TRUE.
      MERGP=.TRUE.
      SFI=SM(NMERG)
      EDGEI=Y(NMERG)
      XMERGE=X
      YMERGE=EDGEI
C*
C*   COMPUTE COEFFICIENTS IN LINEAR EQUATIONS CONNECTING THE
C*   NOZZLE CORNERS WITH MERGE POINT
C*
      CEPTI=DIAO/DIAJ
      SLOPEI=(YMERGE-CEPTI)/XMERGE
      CEPTO=1.
      SLOPEO=(YMERGE-1.)/XMERGE
      GO TO 30
C*
C*   SET NMERGE TO L+1, STORE INNER EDGE SF AND CO-ORDINATE
C*
  259 NU=L
      DO 260 L=1,NU
      IF(UDIF(L).GE.ULIML)  GO TO 210
  260 CONTINUE
  210 NMERG=L
      NMRG1=L-1
      SLOPS=(SM(NMERG)-SM(NMRG1))/(UDIF(NMERG)-UDIF(NMRG1))
      SFI=SM(NMRG1)+SLOPS*(ULIML-UDIF(NMRG1))
      SLOPY=(Y(NMERG)-Y(NMRG1))/(SM(NMERG)-SM(NMRG1))
      EDGEI=Y(NMRG1)+SLOPY*(SFI-SM(NMRG1))
   30 TESTU=.005
      IF(PM(2).NE. 0.) TESTU=PM(2)
      IF(LKK.LE. 3  .AND.  UDIF(NPD).EQ.UDIF(NPD1))  LKK=4
      IF(DIFEU.GT. TESTU .OR.  LKK.LE.3 ) ADDP=.TRUE.
      LKK=LKK+1
      IF(DPRIN)  WRITE (6,7222) ADDP,DIFEU,TESTU
 7222 FORMAT(//12X,L6,2X,2E16.8)
C*
  100 RETURN
      END
```

```
*DECK JTSTEP
      SUBROUTINE JTSTEP
CJTSTP            JET--SOLUTION ROUTINE
      LOGICAL  ICYCLE
      INTEGER TWOJ, ITWO
      LOGICAL SUPC,SUPSTP
      LOGICAL SUBSON
      LOGICAL TROUBL
      LOGICAL DPRIN
      LOGICAL LAST,CORSTP,ADDP,ENTRY1,IER
      LOGICAL  EOF  ,  ERR
      LOGICAL  AXI , XPRN , CMPRS , QJET , TURBJ , CORE
      REAL KCP,MUL,MUEFF,MACH
      REAL  MJET , ME , MUREF
      COMMON /RSTART/ NREG,RESTRT,NRES,MIXPRE
      LOGICAL  MIXPRE
      COMMON /MOLUP/ALXU(200,6),DALXU(200,6),DTKE(200)
      COMMON /DIFEQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /DICTRL/ DIFF , CND(10)
      LOGICAL          DIFF
      COMMON /MOLES/ ALX(200,6)
      COMMON/BCMOL/ALEDGE(6),ALO(6)
      COMMON /JETTWO/
     * TWO    , DIAO    , MJETO   , TJETO   , VJETO   ,
     * PTJETO , TIJETO  , NJO
      REAL  MJETO,MACHO
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI     , MERGE   , XMERGE , YMERGE ,
     * SLOPEI , SLOPEO , CEPTI   , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
      COMMON /SETNEW/  LEDGE, LCOREN
      COMMON /INP1  /          ENTRY1
      COMMON /MISC/ PM(10)
      COMMON /PARAM/
     * AL(200)  , BE(200)  , GM(200)  ,
     * EPS(200) , DL(200)  ,
     * VAR(200) , DVAR(200),
     * SM1(200) , NM1       , SM(200)  , NM        ,
     * DX  ,
     * B1  , C11 , D1  ,
     * AN  , BN  , DN
      COMMON /PARAM1/ ETA(200)
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ        , MJET        , TJET        , PTJET       , VJET        ,
     * TIJET       ,
     * PE          , VE          , ME          , TIE         , TE          ,
     * AXI         , NJ          , NMAX        ,
     * XJ(100)     , XPRN(100)   ,
     * GAM         , RG          , PR          , PRT         ,
```

```
     * SC          , TREF        , MUREF
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA        , CMPRS       , QJET        , TURBJ       , COEF(10)    ,
     * NPU  ,  NPD  , DXC  , XU  , XDD  ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
      COMMON /CORED/ XCORE  , CORE  , CORSTP
C*
      COMMON /SUPER/ SUPC,SUPSTP,XSUP
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP  , SV  , SLEN
C*
C****** JET PROPERTIES COMMON
C*
      COMMON /JET/
     * B(100)    , UC(100)   , TC(100)   , TIC(100) ,
     * PTC(100) , WJ(100)   , YJ(100)
      COMMON /JET1/ FLOWJ,TT0,NX,EJET
      COMMON /ERASE/ YD(200),TKE(200),T(200),DUDY(200)
C*
      COMMON /PROPJT/
     * P         , PRL       , PRTT      , RGAS      , SCC       ,
     * TREFF     , VSREF     , MACH      , XLC       ,
     * REFL      , C         , CHI       , RNORM     ,
     * RHO(200)    , MUL(200)    , KCP(200)    ,
     * MUEFF(200) , XLN(200)    , DK(200)     , RETURB(200)
      COMMON /XPRIN/ DPRIN
      COMMON /EDGE/  YJETE  ,  SFEDGE
      COMMON /UMESH/ DUMU1(4),CXPC,CXTP,NRED
C*
      COMMON /MIXER/  MIX,RDD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
```

```
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /THERM/ GMC(200),CP(200)
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /OUTMIX/ NXORIG
C*
C*
      DIMENSION UU(200),EU(200),THU(200)
      DIMENSION UK(200)
      DIMENSION NAM(6)
      DIMENSION YU(200)
      EQUIVALENCE (YU(1),DSTOR(401))
      EQUIVALENCE  (UK(1),DSTOR(1))
      EQUIVALENCE
     * (C1,COEF(1)),(C2,COEF(2)),(C3,COEF(3)),(C4,COEF(4)),
     * (C5,COEF(5)),(C6,COEF(6)),(C7,COEF(7))
      EQUIVALENCE (C9,COEF(9))
      EQUIVALENCE (ITWO,TWO)
      DATA NAM/1HY,2HSM,3HXLN,2HUD,2HED,3HTHD/
*     DATA ENTRY1/T/
C*
C*  TEST FOR 1-ST STEP(ENTRY1=T)
C*
      ASSIGN 16 TO LGOP
      IF(ENTRY1 .AND. (RESTRT.EQ.BITS)) CORSTP=.FALSE.
    5 IF(ENTRY1) DX=AMIN1(CXPC*B(NRES),.5*DXC)
      IF(RESTRT .EQ. BITS) GO TO 5326
      IF(NREG.GT. 1) DX=AMIN1(CXTP*B(NRES),.5*DXC)
 5326 IF(DXC.EQ.0.) GO TO 5327
      IF(LAST)  GO TO 5327
      DX=AMIN1(DX,.5*DXC)
 5327 CONTINUE
      IF(.NOT.  ENTRY1) GO TO 9
C*
C*----ENTRY 1--INITIALIZE FOR 1-ST STEP.
C*
      CALL SETM(1,0.,ETA,200)
      ICYCLE=.FALSE.
      TWOJ  = 1
      IF( TWO) TWOJ=2
      CALL MOVE(5,PSI,SM,NPU,1,PSI,SM1,NPU,1,UD,UU,NPU,1,THD,THU,NPD,1,
     * ED,EU,NPU,1)
      IF(.NOT. DIFF) GO TO 7000
      DO 7001 L=1,NC
      CALL MOVE(1,ALX(1,L),ALXU(1,L),NPU,1)
 7001 CONTINUE
 7000 NM=NPU
      NM1=NPU
      EC=ED(1)
      THC=THD(1)
      IF(.NOT. TURBJ) CALL SETM(2,EC,ED,200,EU,200)
      IF(.NOT. QJET) CALL SETM(2,THC,THD,200,THU,200)
      EPS1=0.
      IF(AXI) EPS1=1.
```

```
C*
    4 LAST=.FALSE.
      ADDP=.FALSE.
      IF(RESTRT.NE. BITS) GO TO 6
      CORSTP=.FALSE.
      SUPSTP=.FALSE.
      MERSTP=.FALSE.
      NREG=1
      SUBSON=.TRUE.
      IF(MJET.GE.1.) SUBSON=.FALSE.
    6 X=XU
      LCOREN=1
      LEDGE=0
      CALL SETM(1,C1,AL,200)
      CALL MOVE(1,Y,YU,NPU,1)
C*
C*   INCREMENT STEP COUNTER, X-STATION ,ETC.
C*   RETURN FOR NEXT STEP IS MADE TO THIS POINT.
C*
    8 NSTP=NSTP+1
    9 X=X+DX
C*
C*   IF COANNULAR PROBLEM,  SAVE U0,TH0
C*
      IF(.NOT. TWO)   GO TO 9966
      USV0=U0
      THSV0=TH0
 9966 IF (MIX) CALL AITER1(X,DX)
      NHALF=0
      IF(RESTRT.NE.BITS) GO TO 10
      IF(ENTRY1  .OR.  ICYCLE)  GO TO 20
C*
C*   IF 1-ST STEP PROPERTY CALCULATION IS BYPASSED
C*
   10 CALL FMPYC(1,C6,Y,YD,NPU)
      CALL FMPYC(1,EJET,ED,TKE,NPU)
      CALL FMPYC(1,TJET,THD,T,NPU)
C*
C*   CALL SCALE TO COMPUTE WIDTH OF MIXING ZONE(S)
C*   AND REFERENCE SCALES FOR TURBULENCE
C*
   12 CALL SCALE(UU,TWOJ,NREG,X)
C*
C*   COMPUTE PROPERTIES
C*
   15 CALL PROPJ(TWOJ,TURBJ,NREG,X,YD,T,TKE,1,NPU)
      CALL GAMCP(T,GMC,CP,RG,1,NPU)
      GO TO LGOP,  (16,1001)
C*
C*   ADD MESH POINT TO DOWNSTREAM STATION IF ADDP=T.
C*
   16 IF(.NOT.ADDP) GO TO 18
   17 CALL PADD(SM,NPD,NREG)
      ADDP=.FALSE.
   18 NM=NPD
C*
```

```
C*  ASSURE THAT UPSTREAM PSI IS FAR ENOUGH OUT
C*
      IF(SM1(NPU).EQ.SM(NPD)) GO TO 20
      SM1(NPU+1)=SM(NPD)
C*
C*  EXTRAPOLATE APPROXIMATE Y
C*  LINEAR EXTRAPOLATION
C*
      NPU=NPU+1
      NM1=NPU
      DYDPSI=(Y(NPU-1)-Y(NPU-2))/(SM1(NPU-1)-SM1(NPU-2))
      Y(NPU)=Y(NPU-1)+DYDPSI*(SM1(NPU)-SM1(NPU-1))
      UU(NPU)=UU(NPU-1)
      THU(NPU)=THU(NPU-1)
      EU(NPU)=EU(NPU-1)
      T(NPU)=TJET*THU(NPU)
      TKE(NPU)=EJET*EU(NPU)
      YD(NPU)=C6*Y(NPU)
      IF(.NOT. DIFF) GO TO 7002
      DO 7003 L=1,NC
 7003 ALXU(NPU,L)=ALXU(NPU-1,L)
 7002 CALL PROPJ(TWOJ,TURBJ,NREG,X,YD,T,TKE,NPU,NPU)
      CALL GAMCP(T,GMC,CP,RG,NPU,NPU)
C*
C****  SOLUTION OF MOMENTUM EQUATION
C*
   20 CALL MOVE(1,UU,VAR,NM1,1)
C*
C*  TEMPORARILY SAVE CURRENT Y VALUES ON ITERATION
C*
      IF(MIX .AND. (.NOT. ICYCLE))  CALL MOVE(1,Y,YU,NPU,1)
      CALL SETM(1,1.,EPS,NPU)
      CALL SETM(1,C1,AL,NPU)
      CALL SETM(2,0.,CM,NPU,DL,NPU)
      ENTRY1=.FALSE.
      IF(RESTRT.NE.BITS)  RESTRT=BITS
C*
      IF(.NOT. DPRIN)  GO TO 19
      WRITE (6,8680) NSTP,X,DX
 8680 FORMAT(//6X,5HSTEP=,I4,3X,2HX=,E16.8,3X,3HDX=,E16.8//)
      WRITE (6,8681) YJETE,SFEDGE,EDGEI,SFI
 8681 FORMAT(6X,6HYJETE=,E16.8,6X,7HSFEDGE=,E16.8/,
     * 6X,6HEDGEI=,E16.8,6X,7HSFI    =,E16.8//)
      CALL TABPRT(NAM(1),Y,NPU,10,0)
      CALL TABPRT(NAM(2),SM,NPD,10,0)
      CALL TABPRT(NAM(3),XLN,NPD,10,0)
   19 DO 21 L=2,NPU
      RAD=1.
      IF(AXI) RAD=Y(L)**2
      IF(MIX)GM(L)=-C7*DPDX2/(RHO(L)*UU(L))
   23 BE(L)=MUEFF(L)*RHO(L)*UU(L)*RAD
      IF(.NOT. TURBJ) BE(L)=MUL(L)*RHO(L)*UU(L)*RAD
   21 CONTINUE
      BE(1)=0.
      IF(.NOT. AXI) BE(1)=MUEFF(1)*RHO(1)*UU(1)
C*
```

```
C*  BOUNDARY CONDITIONS
C*
      B1=0.
      C11=1.
      D1=0.
      AN=1.
      BN=0.
   22 DN=UEDGE
      IF(.NOT.MIX) GO TO 24
C*
C*  B.C. FOR CONFINED MIXER
C*
      IF(UPSTRM) GO TO 24
      AN=0.
      DN=GRADU
      BN=1.
C*
   24 CALL DFEQ(0,0,0,IER)
      IF(IER) GO TO 999
C*
   25 CALL MOVE(2,VAR,UD,NPD,1,DVAR,DUDY,NPD,1)
      IF(UEDGE.EQ. 0.  .AND. UD(1).GT. 1.) UD(1)=1.
C*
C*
C*
C*  VALUES OF UD WITHIN UD(1)=UCL1,  SET TO UCL1
C*
      UCL1=UD(1)
      CLU=UCL1+1.E-6
      CLL=UCL1-1.E-6
  100 DO 1111 L=1,NM
      IF(UD(L).GE.CLL  .AND.  UD(L).LE.CLU)  UD(L)=UCL1
 1111 CONTINUE
      DO 1112 L=1,NPU
      UK(L)=YOF(SM1(L),SM,UD,1,NPD)
      DUDY(L)=YOF(SM1(L),SM,DVAR,1,NPD)
 1112 CONTINUE
      IF(DPRIN) CALL TABPRT(NAM(4),UD ,NPD,10,0)
C*
C*
C*
C*  TEST FOR TURBULENT PROBLEM
C*
   28 IF(.NOT.  TURBJ) GO TO 7010
C*
C****  SOLUTION OF TKE EQUATION
C*
   30 NM1=NPU
      CALL MOVE(1,EU,VAR,NPU,1)
      DO 31 L=2,NPU
      RAD=1.
      IF(AXI) RAD=Y(L)**2
      RD=RHO(L)*UK(L)
      BE(L)=MUL(L)*DK(L)*RD*RAD
      DUDYSQ=DUDY(L)*DUDY(L)
      GM(L)=C2*MUL(L)*(MUEFF(L)/MUL(L)-1.)*RD*DUDYSQ*RAD
```

```
      IF(RD.EQ.0.   .OR.  UD(L).LE. .005) GO TO 33
      DL(L)=-C5*C*MUL(L)*DK(L)/(RD*XLN(L)*XLN(L))
      GO TO 31
   33 DL(L)=0.
      GM(L)=0.
   31 CONTINUE
      BE(1)=0.
      IF(.NOT. AXI) BE(1)=MUL(1)*DK(1)*RHO(1)*UD(1)
C*
      AN=1.
      BN=0.
   32 DN=EEDGE
      IF(.NOT. MIX)  GO TO 34
      IF(UPSTRM)  GO TO 34
      AN=0.
      DN=0.
      BN=1.
C*
   34 CALL DFEQ(0,0,0,IER)
      IF(IER) GO TO 999
C*
C*  SCAN FOR POSSIBLE NEGATIVES AT JET EDGE--(UEDGE=0)
C*
      IF(UEDGE.NE.0.) GO TO 35
      DO 3391 L=1,NPD
      IF(VAR(L).LT.0.) GO TO 3392
 3391 CONTINUE
      GO TO 35
 3392 LK=L-1
      LL=L
      SLOPE=(VAR(NPD)-VAR(LK))/(SM(NPD)-SM(LK))
      NPD1=NPD-1
      DO 3393 L=LL,NPD1
 3393 VAR(L)=VAR(L-1)+SLOPE*(SM(L)-SM(L-1))
C*
   35 CALL MOVE(1,VAR,ED,NPD,1)
      CALL MOVE(2,DVAR,DTKE,NPD,1,BE,DSTOR(601),NPU,1)
      IF(DPRIN) CALL TABPRT(NAM(5),ED ,NPD,10,0)
C*
C*  TEST FOR SPECIES DEQS
C*
 7010 IF(.NOT.DIFF) GO TO 50
      CALL SETM(2,0.,GM,NPU,DL,NPU)
C*
C*  SOLVE SPECIES EQUATIONS// AIR MOLE FRACTION
C*  COMPUTED BY DIFFERENCE(COMPONENT 1)
C*
 7020 DO 7500 LL=2,NC
      NM1=NPU
      CALL MOVE(1,ALXU(1,LL),VAR,NPU,1)
      DO 7100 L=2,NPU
      RAD=1.
      IF(AXI) RAD=Y(L)**2
      RD=RHO(L)*UK(L)
      BE(L)=MUEFF(L)/SCM(LL)*RD*RAD
 7100 GM(L)=0.
```

```
      BE(1)=0.
      IF(.NOT.AXI) BE(1)=MUEFF(1)*RHO(1)*UD(1)/SCM(LL)
C*
C*   BOUNDARY CONDITIONS
C*
      AN=1.
      BN=0.
 7102 DN=ALEDGE(LL)
C*
 7110 CALL DFEQ(0,0,0,IER)
      IF(IER) GO TO 999
C*
C*   MOVE NEW MOLE FRACTIONS,ETC-INTERP. UPSTRM DALXU
C*
      CALL MOVE(1,VAR,ALX(1,LL),NPD,1)
      DO 7115 L=1,NPU
 7115 DALXU(L,LL)=YOF(SM1(L),SM,DVAR,1,NPD)
C*
 7500 CONTINUE
C*
C*   COMPUTE AIR MOLE FRACTION AND UPSTREAM DERIVATIVE
C*
      DO 7749 L=1,NPD
      ALX(L,1)=1.
      DALXU(L,1)=0.
      DO 7750 LL=2,NC
      ALX(L,1)=ALX(L,1)-ALX(L,LL)
      DALXU(L,1)=DALXU(L,1)-DALXU(L,LL)
 7750 CONTINUE
 7749 CONTINUE
C*
      IF(.NOT.DPRIN) GO TO 50
      DO 5092 LL=1,NC
      CALL TABPRT(CNAME(LL),ALX(1,LL),NPD,10,0)
 5092 CONTINUE
C*   TEST FOR HEAT TRANSFER EFFECTS
C*
C*
   50 IF(.NOT. QJET) GO TO 6554
C****  SOLUTION OF ENERGY EQUATION
C*
   51 NM1=NPU
      CALL SETM(2,0.,DL,NPU,GM,NPU)
      IF(.NOT.TURBJ) GO TO 54
C*
C*
C*   COMPUTE D(DTKE/DY)/DY
C*
C*   COMPUTE TERMS ENTERING INTO SOURCE
C*
C*
      DO 52 L=1,NPU
      BE(L)=C3*DSTOR(L+600)*YOF(SM1(L),SM,DTKE,1,NPD)
   52 CONTINUE
      NPM=NPU-1
   53 CALL DERIV(SM1,BE,GM,2,NPM)
```

```
C*
   54 DO 55 L=2,NPU
   57 RAD=1.
      IF(AXI) RAD=Y(L)**2
      RD=RHO(L)*UK(L)
      AL(L)=AL(L)/CP(L)
      BE(L)=KCP(L)*CP(L)*RD*RAD
      DUDYSQ=DUDY(L)*DUDY(L)
      GM(L)=GM(L)/CP(L)+C4*RD*RAD*MUEFF(L)*DUDYSQ/CP(L)
      IF(UD(L).NE.UCL1) GM(L)=GM(L)
     1  -(YOF(SM1(L),SM,ED,1,NPD)-EU(L))/(DX*CP(L))*EJET/TJET
C     IF(MIX)  GM(L)=GM(L)+C9*DPDX2/(RHO(L)*CP(L))
C     GM(L)=C4*RD*RAD*MUL(L)*DUDYSQ/CP(L)
C     IF(RD .EQ. 0.  .OR.  UD(L) .LE. .005)  GO TO 58
C     GM(L)=C5*C*MUL(L)*DK(L)/(RD*CP(L)*XLN(L)**2)*ED(L)
   58 IF(.NOT. DIFF) GO TO 55
      ETA(L)=TJET*CND(1)*MUEFF(L)*RD*RAD/CP(L)*SUMCPD(L)
   55 CONTINUE
      BE(1)=0.
      IF(.NOT. AXI)  BE(1)=KCP(1)*CP(1)*RHO(1)*UK(1)
C*
      CALL MOVE(1,THU,VAR,NPU,1)
      DN=THEDGE
      IF(.NOT.MIX) GO TO 56
C*
C*  B.C. FOR CONFINED MIXER
C*
      IF(UPSTRM) GO TO 56
      AN=0.
      BN=1.
      DN=0.
   56 CALL DFEQ(0,0,0,IER)
      IF(IER) GO TO 999
      IF(DIFF) CALL SETM(1,0.,ETA,200)
C*
      IF(UEDGE .NE. 0.) GO TO 60
      DO 6691 L=1,NPD
      IF(VAR(L).LT. 0.) GO TO 6692
 6691 CONTINUE
      GO TO 60
 6692 LK=L-1
      LL=L
      SLOPE=(VAR(NPD)-VAR(LK))/(SM(NPD)-SM(LK))
      NPD1=NPD-1
      DO 6693 L=LL,NPD1
 6693 VAR(L)=VAR(L-1)+SLOPE*(SM(L)-SM(L-1))
   60 CALL MOVE(1,VAR,THD,NPD,1)
      IF(DPRIN) CALL TABPRT(NAM(6),THD,NPD,10,0)
C*
C*
C*  COANNULAR PROBLEM-- IF .NOT. MERGE.  COMPUTE U0
C*
 6554 IF(.NOT. TWO) GO TO 6555
      IF(MERGE.OR. (.NOT. MIX)) GO TO 6555
      IF(MERGE) GO TO 6555
      U0=SQRT(USV0**2-144.*GC*R.*TJET*THSV0*(P2-P1)/P1)
```

```
 6555 CONTINUE
C*
C*
C*
C*
C*  LOCATE EDGE OF JET--- ADD POINT IF NECESSARY
C*
   86 CALL JTEDGE(X,YJETE,SFEDGE,ADDP)
C*
   87 CONTINUE
C*
C*  CONFINED MIXER-CHECK FOR CONVERGENCE
C*  OF PRESSURE ITERATION
C*
C*
      IF(.NOT.MIX) GO TO 80
      CALL AITER2
      IF(ADDP .AND. (.NOT. UPSTRM))  ADDP=.FALSE.
      IF(ERR) RETURN
      IF(CVG) GO TO 80
      NM1=NPU
      CALL MOVE(1,YU,Y,NPU,1)
      ICYCLE=.TRUE.
      IF(.NOT. TWO) GO TO 9966
C*
C*  RESTORE ON ITERATION
C*
      U0=USV0
      TH0=THSV0
      GO TO 9966
C*
C*  IF UPSTRM=F, SET SM(NM)= PSID FOR CONFINED MIXER
C*  NO MESH POINTS WILL BE ADDED AFTER THIS POINT
C*
   80 IF (MIX .AND. (.NOT. UPSTRM))  SM(NM)=PSID
C*
C*  MOVE DOWNSTREAM CO-ORDINATES TO UPSTREAM TABLE
C*
C*
      CALL MOVE(1,SM,SM1,NM,1)
      ICYCLE=.FALSE.
C*
C*  TWO- JET LOGIC TO TEST FOR INTERACTION OF INNER AND OUTER JETS
C*
      IF((.NOT. TWO)  .OR.  (.NOT. MERGE)  .OR.  MERSTP) GO TO 776
C*
C*  JETS HAVE MERGED
C*
      MER=.TRUE.
      MERSTP=.TRUE.
      XMRG=XMERGE
      GO TO 102
C*
C*
C*  TEST FOR DISAPPEARANCE OF SUPERSONIC CORE IF JET IS SUPERSONIC
C*
```

```
  776 IF(SUBSON)  GO TO 777
      TCL=TJET*THD(1)
      VCL=VJET*UD(1)
      VSONC=SQRT(GMC(1)*GC*RG*TCL)
      IF(VCL.GE.VSONC) GO TO 777
C*
C*  SUPERSONIC CORE HAS JUST DISAPPEARED
C*
      SUPC=.TRUE.
      SUPSTP=.TRUE.
C*
C*  FLAG NOW SUBSONIC JET
C*
      SUBSON=.TRUE.
      XSUP=X
      GO TO 102
C*
C*
C*  ** SEQUENCE OF TESTS FOR DISAPPEARANCE OF THE
C*  ** POTENTIAL CORE OR THE LAST STEP
  777 IF(LAST) GO TO 220
      IF(UD(2) .EQ. UD(3))  GO TO 310
      IF(CORSTP) GO TO 310
C*
C*  CORE HAS JUST DISAPPEARED
C*
      CORE=.TRUE.
  101 CORSTP=.TRUE.
      NREG=2
      XLC=X
      XCORE=X
  102 CALL XSIZE(DX,X,REFL,NREG,LAST)
      GO TO 500
C*
C*
C*  TEST FOR DISAPPEARANCE OF CORE
C*
  220 LAST=.FALSE.
      IF((UD(2).EQ.UD(3)) .OR.  CORSTP) GO TO 500
C*
C*  CORE HAS JUST DISAPPEARED-SET CORSTP=T.
C*
      GO TO 101
C*
C*
C*  TEST FOR NO. OF MESH POINTS.GT.NM
C*
  310 IF(NPD.GT. NMAX) CALL MSHCUT(NREG,SM,NPD)
C*
C*  ADJUST X-STEP SIZE
C*
  320 CALL XSIZE(DX,X,REFL,NREG,LAST)
      IF(ERR) GO TO 500
C*
      CALL MOVE(3,UD,UU,NM1,1,ED,EU,NM1,1,THD,THU,NM1,1)
      NPU=NM1
```

```
      IF(.NOT.DIFF) GO TO 8
      DO 7700 LL=1,NC
      CALL MOVE(1,ALX(1,LL),ALXU(1,LL),NM1,1)
 7700 CONTINUE
      GO TO 8
C*
C*  ERROR RETURN
C*
  999 ERR=.TRUE.
C*
  500 CONTINUE
      NPU=NM1
 1000 CALL MOVE(4,UD,UU,NM1,1,ED,EU,NM1,1,THD,THU,NM1,1,
     * SM1,PSI,NM1,1)
      IF(.NOT.DIFF) GO TO 7740
      DO 7730 LL=1,NC
      CALL MOVE(1,ALX(1,LL),ALXU(1,LL),NM1,1)
 7730 CONTINUE
 7740 ASSIGN 1001 TO LGOP
      GO TO 10
C*
 1001 IF(PM(10).NE. 0.)  CALL TABPRT(NAM(3),XLN,NPD,10,0)
      RETURN
      END
```

```
*DECK JTOUTS
      SUBROUTINE JTOUTS
CJTOUTS          SUMMARY PRINT OF JET PROPERTIES
      LOGICAL  EOF  ,  ERR
      LOGICAL TAPIN,TAPOT
      LOGICAL   AXI , CMPRS , QJET , TURBJ , CORE
      LOGICAL       ENDJOB,ENDJW
      INTEGER XPRN1(100)
      EQUIVALENCE (XPRN,XPRN1)
      INTEGER PLOT
      REAL  MJET , ME , MUREF
      COMMON /ADAM02/ ENDJOB   , DUM02(3)
      COMMON /DIFEQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /DICTRL/ DIFF , CND(10)
      LOGICAL          DIFF
      COMMON /MOLES/ ALX(200,6)
      COMMON/BCMOL/ALEDGE(6),ALO(6)
      COMMON /JETTWO/
     * TWO    , DIAO    , MJETO   , TJETO   , VJETO   ,
     * PTJETO , TIJETO  , NJO
      REAL  MJETO,MACHO
      COMMON /BCO/  UO, EO, THO
      COMMON /CTRL2/
     * EDGEI  , SFI     , MERGE   , XMERGE  , YMERGE  ,
     * SLOPEI , SLOPEO  , CEPTI   , CEPTO
      COMMON /MERGET/  MER, MERSTP , XMRG
      LOGICAL  TWO, MERGE , MER , MERSTP
      COMMON /IOFILE/ TAPIN,TAPOT
      COMMON /PARAM/
     * U(200),T(200),TOT(200),XMACH(200),PTOT(200),TTD(200),
     * PTD(200),UDC(200),DUMP9(209)
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ        , MJET         , TJET         , PTJET        , VJET         ,
     * TIJET       ,
     * PE          , VE           , ME           , TIE          , TE           ,
     * AXI         , NJ           , NM           ,
     * X(100)      , XPRN(100)    ,
     * GAM         , RG           , PR           , PRT          ,
     * SC          , TREF         , MUREF
C*
C****** CONTROL COMMON
C*
      COMMON /CTRL/
     * NXTA        , CMPRS        , QJET         , TURBJ        , COEF(10)     ,
     * NPU  ,  NPD  , DXC  , XU   , XDD  ,
     * DSTOR(800)
C*
C****** PROFILE COMMON
C*
      COMMON /PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
C*
```

```
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
      COMMON /CORED/ XCORE  , CORE  , CORSTP
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP  , SV  , SLEN
C*
C****** JET PROPERTIES COMMON
C*
      COMMON /JET/
     * B(100)   , UC(100)  , TC(100)  , TIC(100) ,
     * PTC(100) , WJ(100)  , YJ(100)  ,
     * YSONIC(100)
      COMMON /JET1/ FLOWJ,TTO,NX,EJET
      COMMON /JET2/  TTC(100)
      COMMON/ADAM01/
     * NAME(6),ADDRES(6),TITLE(6),IDENT(6)
      COMMON /MISC/  PM(10),  PLOT
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /THERM/ GMC(200),CP(200)
      COMMON /MIXPRP/ MA2(100),VE2(100),TE2(100),TWC(100)
      REAL MA2
      COMMON /THRST/  WV(100)
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /OUTMIX/ NXORIG
      COMMON /JET3/ STADD, NV, STATF
      LOGICAL  STADD,STATF
C*
      DIMENSION TI(200)
      DIMENSION LF1(3)
      DIMENSION  HEAD1(2,2), FORM1(2)
      EQUIVALENCE (TI(1),DSTOR(1))
      EQUIVALENCE  (IMIX, MIX)
      DATA LF1/6HSUBSON,6HSUPSON,6HCHOKED/
      DATA HEAD1/6HFREE J,2HET,6HCONFIN,6HED JET/
```

```
      DATA ENDJW/F/
C*
    1 IF(PLOT.GT.  0   .OR.   TAPOT) CALL JTFILE(2,DUM)
      KMIX  = 1
      IF( MIX ) KMIX=2
      DO 6 L=1,2
    6 FORM1(L)=HEAD1(L,KMIX)
      DO 7 L=1,NXTA
      IF(INDC(L).EQ.0) INDC(L)=LF1(1)
      IF(INDC(L).EQ.1) INDC(L)=LF1(2)
      IF(INDC(L).EQ.2) INDC(L)=LF1(3)
    7 CONTINUE
      TERMD=.5*DIAJ
      CALL FMPYC(1,TERMD,YCB,YCB,NXORIG)
      WRITE (6,100)
      NSTART=1
      NLINES=NXTA
      IF(NLINES.GT.50) NLINES=50
      NL=NLINES
    2 WRITE(6,110) FORM1,NAME,IDENT
    3 WRITE (6,120)
      NEND=NL
      ASSIGN 10 TO LGO
    5 DO 5002 L=NSTART,NEND
      IF( YSONIC(L) .EQ.BITS ) GO TO 5000
      WRITE (6,200) L,X(L),B(L),YJ(L),UC(L),TC(L),TIC(L),PTC(L),
     * TTC(L),YSONIC(L),WJ(L)
      GO TO 5002
 5000 WRITE (6,201) L,X(L),B(L),YJ(L),UC(L),TC(L),TIC(L),PTC(L),
     * TTC(L),WJ(L)
 5002 CONTINUE
      GO TO LGO  , (10,20)
C*
C*** CHECK FOR ADDITIONAL LINES
C*
   10 IF(NXTA.LE.50) GO TO 20
      NSTART=NEND+1
      NEND=NXTA
      WRITE (6,100)
      WRITE (6,120)
      ASSIGN 20 TO LGO
C*
      GO TO 5
C*
C*  IF CONFINED JET CASE, PRINT CONFINED JET OUTPUT
C*
   20 IF(.NOT. MIX) GO TO 21
      WRITE (6,100)
      NSTART=1
      NLINES=NV
      IF(NLINES.GT.50) NLINES=50
      NL=NLINES
   22 WRITE(6,110) FORM1,NAME,IDENT
   23 WRITE (6,140)
      NEND=NL
      ASSIGN 30 TO LGO
```

```
   25 WRITE(6,2000) (L,XD(L),RD(L),YCB(L),YR(L),YCD(L),
     * PD(L),INDC(L),WV(L),MA2(L),VE2(L),TE2(L),L=NSTART,NEND)
      GO TO  LGO , (30,21)
C*
   30 IF(NV.LE.50) GO TO 21
      NSTART=NEND+1
      NEND=NV
      WRITE (6,100)
      WRITE (6,140)
      ASSIGN  21 TO LGO
      GO TO 25
C*
   21 IF(.NOT. ENDJW)  RETURN
C*
C****************************     FORMAT STATEMENTS      *******************
C*
  100 FORMAT (1H1)
  110 FORMAT (39X,47H*    J E T    A N A L Y S I S    P R O G R A M    *//
     *    48X,2A6,6X,6HMIXING//30X,6A10/30X,6A10//)
  120 FORMAT(38X,51H*    SUMMARY  -  STATION DATA  -  JET PROPERTIES    *
     *//,4X,1HN,10X,1HX,13X,1HB,11X,2HYJ,12X,2HUC,
     * 12X,2HTC,11X,3HTIC,7X,3HPTC,8X,3HTTC,5X,6HYSONIC,6X,2HWJ//)
  200 FORMAT(3X,I3,F14.5,F13.5,F14.5,F15.7,F14.7,E15.6,
     * 0PF9.6,3F10.6)
  201 FORMAT(3X,I3,F14.5,F13.5,F14.5,F15.7,F14.7,E15.6,
     * F9.6,F10.6,10X,F10.6)
  140 FORMAT(4X,1HN,6X,2HXD,8X,2HRD,7X,3HYCB,8X,2HYD,9X,3HYCD,
     * 9X,2HPD,5X,4HFLOW,2X,6HTHRUST,6X,3HMA2,5X,3HVE2,
     * 6X,3HTE2//)
 2000 FORMAT(3X,I3,3F10.4,2F12.7,F9.4,1X,A6,F11.3,F7.4,F9.3,F8.2)
C*
C*
C*******************************      JTOUTP ENTRY     ************************
C*
C*    PROFILE PRINTOUT
C*
      ENTRY JTOUTP
      PK=PE
      IF(MIX) PK=P2
C*
C*
   50 NSTA=NX
   51 XSTA=X(NX)
C*
C*   CONVERT TURBULENCE ENERGIES TO INTENSITIES
C*
   52 CON1=SQRT(2.*GCJ*EJET/3.)/VJET
      DO 53 L=1,NPD
   53 TI(L)=CON1*SQRT(ED(L))
C*
C*   COMPUTE ADDITIONAL DIMENSIONLESS AND DIMENSIONAL PROFILES
C*
      UC1=1./UC(NX)
      TMPT=1./(TT0-TE)
      PTPT=1./(PTJET-PE)
      CALL FMPYC(1,TJET,THD,T,NPD)
```

```
      CALL GAMCP(T,GMC,CP,RG,1,NPD)
      DO 600 L=1,NPD
      U(L)=VJET*UD(L)
      IF(.NOT. CMPRS)  GO TO 600
      GAM=GMC(L)
      GM2=2./(GAM-1.)
      GMM=GAM/(GAM-1.)
      CPJ=CP(L)
      GCJCP=1./(GCJ*CPJ)
      TOT(L)=T(L)+.5*U(L)*U(L)*GCJCP+EJET*ED(L)/CPJ
      XMACH(L)=U(L)/SQRT(GAM*RG*GC*T(L))
      PTOT(L)=PK*(1.+XMACH(L)**2/GM2 )**GMM
      TTD(L)=(TOT(L)-TE)*TMPT
      PTD(L)=(PTOT(L)-PE)*PTPT
  600 CONTINUE
      IF(.NOT. CMPRS)  CALL SETM(5,BITS,TOT,NPD,XMACH,NPD,
     * PTOT,NPD,TTD,NPD,PTD,NPD)
C*
      IF( XPRN1(NX).NE.0 .AND. TAPOT )
     * CALL JTFILE(1,XSTA)
      IF(XPRN1(NX) .LT. 0)  GO TO 1111
   55 WRITE (6,300)
      NSTART=1
      NLINES=NPD
      IF(NLINES.GT.50) NLINES=50
      NL=NLINES
   56 WRITE (6,310) NSTA,XSTA,PK
      NEND=NL
      ASSIGN 60 TO LGO1
   57 WRITE (6,320) (L,Y(L),PSI(L),UD(L),THD(L),TI(L),TTD(L),PTD(L),
     * XMACH(L),U(L),T(L),TOT(L),PTOT(L),L=NSTART,NEND)
      GO TO LGO1  , (60,90)
C*
C*  CHECK FOR ADDITIONAL PRINT LINES
C*
   60 IF(NPD.LE. 50) GO TO 90
      WRITE (6,100)
      WRITE (6,310) NSTA,XSTA,PK
      NRMN=NPD-NL
      IF(NRMN.GT.50) GO TO 65
      NSTART=NEND+1
      NEXT=MIN0(50,NRMN)
      NL=NL+NEXT
      ASSIGN 90 TO LGO1
      NEND=NL
      GO TO 57
   65 NSTART=NEND+1
      NEND=NL+50
      NL=NL+50
      GO TO 57
C*
C*
C*  PRINT CONCENTRATION PROFILES
C*
   90 IF(.NOT. DIFF) GO TO 1111
      WRITE (6,300)
```

```
      NSTART=1
      NLINES=NPD
      IF(NLINES.GT.50) NLINES=50
      NL=NLINES
 1112 WRITE (6,311) NSTA,XSTA,PK,CNAME
      NEND=NL
      ASSIGN 1120 TO LG01
 1113 WRITE (6,321) (L,Y(L),PSI(L),(ALX(L,LL),LL=1,6),L=NSTART,NEND)
      GO TO  LG01  , (1120,1111)
C*
 1120 IF(NPD.LE.50) GO TO 1111
      WRITE (6,300)
      WRITE (6,311) NSTA,XSTA,PK,CNAME
      NRMN=NPD-NL
      IF(NRMN.GT.50) GO TO 1114
      NSTART=NEND+1
      NEXT=MIN0(50,NRMN)
      NL=NL+NEXT
      ASSIGN 1111 TO  LG01
      NEND=NL
      GO TO  1113
 1114 NSTART=NL+50
      NEND=NL+50
      NL=NL+50
      GO TO 1113
C******************************  FORMAT STATEMENTS   *********************
C*
  300 FORMAT(1H1,50X,28H*  JET  ANALYSIS  PROGRAM  *//)
  310 FORMAT(26X,16HPROFILES-- STA (,I3,6H)   X=,F10.5,
     * 3X,9HPRESSURE=,F10.4//
     *  22X,1H*,21X,21H**  DIMENSIONLESS  **,22X,
     *  2H**,12X,19H**  DIMENSIONAL  **, 9X,1H*/
     * 2X,1HN,6X,1HY,9X,3HPSI,8X,2HUD,7X,3HTHD,9X,2HTI,8X,3HTTD,8X,
     *  3HPTD,6X,4HMACH,8X,1HU,11X,1HT,9X,3HTOT,7X,4HPTOT//)
  311 FORMAT(12X,22HMOLE FRACTIONS-- STA (,I3,6H)   X=,
     * F10.5,3X,9HPRESSURE=,F10.4//
     * 2X,1HN,6X,1HY,9X,3HPSI,7X,A6,5X,A6,5X,A6,5X,A6,5X,A6,5X,A6//)
  320 FORMAT(1X,I3,F11.5,E11.4,F9.6,F10.6,E12.5,F10.7,
     *  F11.7,F9.5,3F11.4,F10.4)
  321 FORMAT(1X,I3,F11.5,E11.4,F11.8,5F11.8)
C*
 1111 RETURN
      END
```

```
*DECK MSHCUT
      SUBROUTINE MSHCUT(NREG,YM,NPD)
CMSHCUT          MESH REFINEMENT ROUTINE
      LOGICAL MCHANG
      COMMON /PROF/
     * DUM(400),UD(200),THD(200),ED(200)
      COMMON /UMESH/ MCHANG,CK,DY1,NMSH,          CXPC,CXTP,NRED
      COMMON /MISC/ PM(10)
C*********C*
C*
      COMMON /CTRL2/  DUM24(2), MERGE , DUM26(6)
      COMMON /BCO/ U0, E0, TH0
      COMMON /JETTWO/ TWO, DUM55(7)
      LOGICAL TWO, MERGE
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /CNERR/ BITS,ERR,GC,GCJ,FOOT
      LOGICAL ERR
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
C*
C*********C*
      DIMENSION IMP(10)
      EQUIVALENCE (IMP(1),PM(1))
      DIMENSION YM(1)
C*
C*  REDUCE NO. OF POINTS IN DOWNSTREAM MESH BY NRED
C*
      IF(IMP(1).EQ.0) GO TO 1
      CALL TABPRT(4HPSIB,YM,NPD,10,0)
      CALL TABPRT(2HUD,UD,NPD,10,0)
      CALL TABPRT(3HTHD,THD,NPD,10,0)
      CALL TABPRT(2HED,ED,NPD,10,0)
    1 KGO=NREG
   10 YE=YM(NPD)
      IF(.NOT.  MCHANG) GO TO 11
      GO TO (11,20,20), KGO
C*
C*  POTENTIAL CORE REGION--
C*  RECALCULATE NEW UNIFORM MESH.
C*
   11 LK=2
      IF(.NOT.  TWO)  GO TO 6312
      TESTL=U0-1.E-6
      TESTU=U0+1.E-6
      DO 6311 L=1,NPD
```

```
      IF(UD(L).GE.TESTL  .AND.  UD(L).LE.TESTU)  UD(L)=U0
 6311 CONTINUE
 6312 IF(.NOT. MCHANG) GO TO 166
      DO 14 L=2,NPD
      IF(UD(L).NE. UCL1)  GO TO 16
   14 CONTINUE
   16 LK=L
C*
      IF((.NOT. TWO) .OR. MERGE) GO TO 166
      DO 17 L=LK,NPD
      IF(UD(L).EQ.U0) GO TO 18
   17 CONTINUE
   18 LK=L
      DO 19 L=LK,NPD
      IF(UD(L).NE. U0)  GO TO 167
   19 CONTINUE
  167 LK=L
  166 LK1=LK-1
      NPD=NPD-NRED
      DY=(YE-YM(LK1))/FLOAT(NPD-LK1)
      DO 15 L=LK,NPD
   15 YM(L)=YM(L-1)+DY
      GO TO 100
C*
C*  TRANSITION/SIMILAR REGION-- CALCULATE NEW DY-1
C*
   20 NPD=NPD-NRED
      STEPS=FLOAT(NPD-1)
      DYC=YE/(CK**STEPS-1.)*(CK-1.)
      DO 30 L=2,NPD
      XXP=FLOAT(L-1)
   30 YM(L)=DYC*(CK**XXP-1.)/(CK-1.)
C*
  100 IF(IMP(1).EQ.0) GO TO 101
      CALL TABPRT(4HPSIA,YM,NPD,10,0)
  101 RETURN
      END
```

```
*DECK PADD
      SUBROUTINE PADD(YM,NPD,REG)
CPADD              ADDITION OF MESH POINTS AT JET EDGE
      LOGICAL MCHANG
      INTEGER REG
      COMMON /UMESH/ MCHANG,CK,DY1,NMSH       , CXPC,CXTP,NRED
      COMMON/ INPJET/ DUMI(12),  NJ  , DUMK(208)
      DIMENSION YM(1)
C*
C***  REG=1-- USE CONSTANT MESH SIZE  (POTENTIAL CORE)
C**   REG=2,3-- USE MESH DEFINED BY /UMESH/
C*
      IF(.NOT. MCHANG) GO TO 10
    1 GO TO (10,20,20),REG
   10 YK=YM(NPD)
      DY=YK-YM(NPD-1)
      NPD=NPD+1
      YM(NPD)=YK+DY
      GO TO 100
C*
   20 DYF=YM(2)-YM(1)
      NEW=NPD+1
      YM(NEW)=DYF/(CK-1.)*(CK**FLOAT(NPD)-1.)
      NPD=NEW
C*
  100 RETURN
      END
```

```
*DECK QIREM
      SUBROUTINE QIREM(X,Y, XJP, QV)
*QIREM-         QUADRATIC INTERPOLATION ROOT EVALUATION        "QIREM"
C               FOR FUNCTIONS WITH MAXIMUMS

      DIMENSION QV(8)
      DATA KNAME/6HQIREM /

C     INPUT-
C        X      = ABSCISSA
C        Y      = ORDINATE (OR ERROR)
C        XJP    = X-JUMP TO BE TAKEN BEFORE ROOT/MAX IS SPANNED,  THE SIGN I
C                   A POSITIVE ERROR
C        QV     = STORAGE FOR EIGHT ELEMENT QIRE VECTOR
C        QV(1)  = CTR =0. (FIRST ENTRY ONLY)
C        YTOL   = TOLERANCE ON THE ERROR
C        YO     = ORDINATE TO BE OBTAINED (OPTIONAL)
C        DYDX   = ESTIMATE OF SLOPE FOR 2ND GUESS (OPTIONAL)
C        CTRMAX= MAXIMUM NO. OF ITERATIONS (=25 IF NOT SPECIFIED)

C     OUTPUT-
C        X      = NEXT X ESTIMATE
C        QV(1)  = 0. IF  YTOL  HAS BEEN SATISFIED
C        QV(5)  = 0. IF MAX PT HAS BEEN FOUND WITHIN YTOL,
C                         AND ABS(E).GT.YTOL.

C     NOTES-
C        C      = THIRD COEFFICIENT IN THE EQUATION- Y=A+B*X+C*X**2
C               = D12 IN QIRE NOTATION
C        N1     = EXIT VALUE OF QV(5),  N1=4 IF  X  IS THE PRECICTED MAX PT,
C                 N1=+5(-5) IF X IS JUST TO THE LEFT(RIGHT) OF THE PREVIOUSL
C                 PREDICTED MAX PT, N1=6 IF X IS THE SECOND PT CLOSE TO THE
C                 OTHERWISE N1=N.
C        M      = ENTRY VALUE OF QV(5)
C        SGM    = SIGN OF  M  IF ABS(M)=5
C        SDYDX  = SIGN OF THE SLOPE OF THE CURVE
C        XJ     = JUMP TO BE TAKEN FROM LAST  X
C        XJA    = ABSOLUTE VALUE OF MAXIMUM JUMP = ABS(XJP)
C        XM     = DISTANCE FROM CENTRAL PT TO MAX/MIN OF PARABOLA, =XMAX-XX(
C                 OR = DISTANCE FROM CENTRAL PT TO THE ROOT,  =XROOT-XX(2)
C        X1     = INPUT (OR LAST) X VALUE

      COMMON /CQIREM/ YTOL,YO,DYDX,CTRMAX
      COMMON /ERASE / BOT,C,DXDY,E,I,II,IN,ISPAN,M,N,RADICL,SDYDX,SGN,
     1               TOP,X1,X13,X13P,XJ,XJA,XM, DX(3),DY(3),QV1(10)
      DIMENSION XX(4),YY(4)
      EQUIVALENCE (CTR,QV1(1)), (N1,QIND,QV1(5)),
     1             (XX,QV1(2)), (YY,QV1(6))

C     INITIALIZING  AND  PRELIMINARY CHECKING
      IF(CTRMAX.EQ.0.) CTRMAX=25.
      DO 30 I=1,8
   30 QV1(I)= QV(I)
      N1     = IFIX(QV1(5))
      E      = Y-YO
      M      = N1
```

```
      IF(CTR.EQ.0.) M=0
      SGM   = 1.
      IF(M.GE.0) GO TO 36
      M     = 5
      SGM   = -1.
   36 N     = MIN0(M,3)
C     SDYDX = SIGN(1.,-XJP)
C     (ALTERNATE CALC TO CIRCUMVENT COMPILER ERROR)
      IF(XJP) 41,42,42
   41 SDYDX = 1.
      GO TO 43
   42 SDYDX = -1.
   43 XJA   = ABS(XJP)
      X1    = X
      IF(M-5) 44,45,46
   44 IF(ABS(E).LE.YTOL) GO TO 800
      IF(M.EQ.4 .AND. ABS(E-YY(2)).LE.YTOL) GO TO 700
      IF( CTR.GE.CTRMAX ) GO TO 930
      GO TO 50
   46 M     = 3
   45 X13P  = XX(3)-XX(1)

C     DETERMINE INDEX FOR INSERTING CURRENT X,E INTO XX,YY TABLE WHICH IS
C       ORDERED ACCORDING TO X.
   50 IN    = 1
      IF(N.EQ.0)         GO TO 90
   60  IF(XX(IN).GT.X1) GO TO 70
       IN     = IN+1
       IF(IN.LE.N)       GO TO 60
      GO TO 90

C     RELOCATE IN PREPARATION FOR INSERTING  X,E
   70 II    = N+1
   80  XX(II)= XX(II-1)
       YY(II)= YY(II-1)
       II    = II-1
       IF(II.NE.IN) GO TO 80

C     INSERT NEW POINT
   90 N     = N+1
      XX(IN)= X1
      YY(IN)= E

C     LOCATE INTERVAL WHICH SPANS ROOT
      ISPAN = 0
      IF(N.EQ.1) GO TO 200
       DO 110 I=2,N
       IF(SDYDX*YY(I).GT.0. .AND. SDYDX*YY(I-1).LT.0.) ISPAN=I
  110  CONTINUE

C     REDUCE  XX,YY TABLE TO THREE POINTS
      IF(N.LE.3)        GO TO 200
      IF(ISPAN.EQ.0) GO TO 140
C     (ROOT HAS BEEN SPANNED)
  122 IF(ISPAN.EQ.N) GO TO 150
      IF(ISPAN.EQ.2) GO TO 175
```

```
      IF(ABS(YY(1)).GT.ABS(YY(4))) GO TO 150
      GO TO 175

C     (ROOT HAS NOT BEEN SPANNED)
  140 IF(IN.LE.2)     GO TO 175

C     DELETE FIRST POINT
  150  DO 160 I=1,N
       XX(I) = XX(I+1)
  160  YY(I) = YY(I+1)
      ISPAN = ISPAN-1
C     DELETE FOURTH POINT
  175 N      = N-1

C     SIMPLE X-JUMP PREDICTION
  200 N1     = N
      IF(ISPAN.GT.0 .OR. DYDX.NE.0.) GO TO 205
C     XJ     = SDYDX*SIGN(XJA,-E)
C     (ALTERNATE CALC TO CIRCUMVENT COMPILER ERROR)
      XJ     = XJP
      IF(E.LT.0.) XJ=-XJ
      GO TO 900

C     CURVE FIT PREDICTIONS
  205 IF(N-2) 210,220,300

C     ONE POINT PREDICTION BASED ON INPUT VALUE OF DXDY
  210 XJ     = -E/DYDX
      GO TO 900

C     TWO POINT STRAIGHT LINE PREDICTION
  220 BOT    = YY(2)-YY(1)
      IF(BOT.EQ.0.) GO TO 230
      DXDY   = (XX(2)-XX(1))/BOT
      IF(DXDY*SDYDX.GT.0.) GO TO 240
C     (CURVE SLOPE IS WRONG - MOVE TOWARD MAXIMUM POINT)
  230 XJ     = -3.*SDYDX*XJA
      GO TO 900
C     (CURVE SLOPE IS CORRECT)
  240 XJ     = -E*DXDY
      GO TO 900

C     PARABOLIC CURVE FIT PREDICTION
  300 DX(1) = XX(1)-XX(2)
      DX(3) = XX(3)-XX(2)
      DY(1) = YY(1)-YY(2)
      DY(3) = YY(3)-YY(2)
      BOT    = DX(1)*DY(3) - DX(3)*DY(1)
      IF(ABS(BOT).LT.1.E-12) GO TO 600
      TOP    = DX(1)*DX(1)*DY(3) - DX(3)*DX(3)*DY(1)
      XM     = .5*TOP/BOT
      X13    = XX(3)-XX(1)
      IF(ABS(XM).GT.ABS(1.E3*X13)) GO TO 600
      C      = BOT/(DX(1)*DX(3)*X13)
      RADICL= XM*XM - YY(2)/C
      IF(RADICL.LT.0.) GO TO 360
```

```
      SGN    = SIGN(1.,SDYDX*C)
      XM     = XM + SGN*SQRT(RADICL)
      GO TO 890
C     (IMAGINARY ROOT, HENCE WE ARE LOOKING FOR THE MAXIMUM POINT,
C     PREDICT MAX PT IF M=3, SELECT PTS ON LEFT/RIGHT SIDE OF PREVIOUSLY
C     PREDICTED PT IF M=4/5)
  360 IF(M-4) 363,364,365
  363 IF(ABS(XM).LT.XJA) N1=4
      GO TO 890
  364 XJ     = -X13/8.
      N1     = 5
      IF(IN.GT.2) GO TO 900
      XJ     = -XJ
      N1     = -5
      GO TO 900
  365 XJ     = SGM*X13P/4.
      N1     = 6
      GO TO 900

C     RETREAT TO LINEAR INTERPOLATION
  600 IF(ISPAN.GT.0) GO TO 122
      GO TO 140

C     MAXIMUM FOUND
  700 QIND   = 0.
      GO TO 930

C     SOLUTION FOUND
  800 CTR    = 0.
      GO TO 930

C     FINIS
  890 X1     = XX(2)+XM
      GO TO 910
  900 X1     = X1+XJ
  910 CONTINUE
      X      = AMAX1(XX(1)-XJA,AMIN1(X1,XX(N)+XJA))
      CTR    = CTR+1.
  930 DO 950 I=1,8
  950 QV(I) = QV1(I)
      QV(5) = FLOAT(N1)
  999 RETURN
      END
```

```
*DECK SUMCPD
      FUNCTION  SUMCPD(L)
CSUMCPD         DIFFUSION FLUX TERM FOR ENERGY EQUATION
      COMMON /ERASE/ DUMS1(400), T(200), DUMS2(200)
      COMMON /DIFFQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /MOLUP/ ALXU(1200),DALXU(200,6),DUME(200)
      DIMENSION  CPT(6)
C*
C*
C*
    1 TEMP=T(L)
      DO 10 K=1,NC
   10 CPT(K)=CPC(1,K)+CPC(2,K)*TEMP+CPC(3,K)*TEMP*TEMP
C*
C*
C*  MULTIPLY BY GRADIENTS/SCHMIDT NUMBERS AND SUM
C*
   12 SUMCPD=0.
      DO 15 K=1,NC
   15 SUMCPD=SUMCPD+CPT(K)/SCM(K)*DALXU(L,K)
   20 RETURN
      END
```

```
*DECK TDSEQ
      SUBROUTINE TDSEQ(A,N2,ID,FN)
CTDSEQ          TRIDIAGONAL MATRIX-SIMULTANEOUS EQUATIONS
C*
C*   A=  COEFFICIENT ARRAY---A,B,C,D BY COLUMNS
C*  FIRST COLUMN DESTROYED BY SOLUTION VECTOR
C********        SOLUTION VECTOR RETURNED AS FIRST COLUMN OF A ARRAY
C*
C*
C*  IF NORMAL DERIVATIVE CONDITIONS ARE ENFORCED USING 1ST TWO
C*  POINTS ABOVE OR BELOW THE BOUNDARIES,  A(1) AND/OR A(3*N2).NE. 0.-
C*  THIS CONDITION IS FLAGGED BY IL AND/OR IU=1.
      DIMENSION A(800)
C*
      ISIZE=ID
      I2=ISIZE+1
      IF (A(I2)) 12,11,12
   11 FN=1.
      GO TO 50
   12 I3=2*ISIZE+1
      I4=3*ISIZE+1
      IU=0
      IL=0
      G=0.
      IF(A(1).NE.0.) IL=1
      INM=I3+N2-1
      IF(A(INM) .NE.0.) IU=1
      G=A(1)/A(I2)
      A(I3)=A(I3)/A(I2)
      A(1)=A(I4)/A(I2)
      N=N2
      DO 10 I=2,N
      I2=ISIZE+I
      I3=I2+ISIZE
      I4=I3+ISIZE
      IF(I.NE. N .OR. IU.NE.1) GO TO 15
      A(I)=A(I)-A(I3)*A(I3-2)
      A(I4)=A(I4)-A(I3)*A(I-2)
   15 CONTINUE
      A(I2)=A(I2)-A(I)*A(I3-1)
      IF (A(I2)) 13,11,13
   13 IF(I.EQ.2 .AND. IL.EQ.1) A(I3)=A(I3)-A(I)*G
      IF(I.EQ.N .AND. IU.EQ.1) GO TO 10
      A(I3)=A(I3)/A(I2)
   10 A(I)=(A(I4)-A(I)*A(I-1))/A(I2)
      I=N
   20 I=I-1
      IF (I) 40,40,30
   30 I3=2*ISIZE+I
      A(I)=A(I)-A(I3)*A(I+1)
      IF(IL.EQ.1 .AND. I.EQ.1) A(I)=A(I)-G*A(I+2)
      GO TO 20
   40 FN=0.
   50 RETURN
      END
```

```
*DECK XSIZE
      SUBROUTINE XSIZE (DX,X,REFL,NREG,LAST)
CXSIZE             X-STEP SIZE CONTROL
      LOGICAL LAST
      COMMON /SETNEW/  LKK,LC
      COMMON /UMESH/ DUMX(4),CXPC,CXTP,NRED
      COMMON /CTRL/ DUMSX(9), C6 , DUMSX1(8), XD  , DUMSX2(800)
C*
C*  NREG=1,  DX PROPORTIONAL TO B
C*  NREG=2,3 DX PROPORTIONAL TO JET RADIUS
C*
C*
      L-ST=.FALSE.
      DXT=XD-X
    1 GO TO (10,20,20),NREG
C*
   10 DX=CXPC*REFL/C6
      IF(DX.GE.  .99*DXT)  DX=DXT
      XT=X+DX
      GO TO 50
C*
   20 IF(LC.GT.10)  GO TO 30
      DX=.1*FLOAT(LC)*CXTP*REFL/C6
      LC=LC+1
      GO TO 40
   30 DX=CXTP*REFL/C6
  40  IF(DX.GE.  .99*DXT)  DX=DXT
      XT=X+DX
C*
C*
C*  CHECK FOR X.GT. CALCULATION STATION
C*
   50 IF( XT.LT. (XD-1.E-8) ) GO TO 100
      LAST=.TRUE.
      DX=XD-X
C*
  100 RETURN
      END
```

```
*DECK SSFD
      OVERLAY(SSNOISE,2,0)
      PROGRAM SSFD
*MAINS
      REAL MJET
      LOGICAL CARRY
      LOGICAL AXISYM,DUAL,SSTRM,PCONT,BARPRT,SLIP,SOLID
      LOGICAL MDISCC
      COMMON/TROUBL/ ERR,ENDJOB
      LOGICAL         ERR,ENDJOB
      COMMON/CPI/PI,TWOPI,PIO2,PIO4,TODEG,TORAD
      COMMON/CNTRL/DUMC5(8),CARRY
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2 ,PSIDUM(23,2),           R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5,TTSAVE(1,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON/FILK/CSC
      COMMON/CUPDAT/MAP,IMAP,NDIGIT(14)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CINPUT/ PT(40,2),TT(1,2),PRESS(40,2),YIN(40,2),ZM(40,2)
     1,THETA(40,2),TANTH(40,2),XLOW(20,2),YLOW(20,2),XUP(20,2),YUP(20,2)
     2,NSTRM(2),NPTSL(2),NPTSU(2),PUP(20,2),PLOW(20,2)
      COMMON /CBITS/ BITS,BLANK
      COMMON /CENTRO/ PTOTJ(20,46),XPT(20),NPT,DUM45(45)
      COMMON /CXPR/ XPR(4)
      COMMON /CBDYPR/ XBDY(4)
      COMMON /CPUNCH/ IPUNCH
      COMMON /TKEIN/ XTKE(20),TKEBDY(20),NTKE,XLTKE(20),MJET,XDM(100),
     1 TIJET,TJET,DIAJ
      COMMON/KEYS/KEY(11),KEYB(11),KODA(11),KODB(11)
      COMMON /CNTROP/ RHS2  ,RHS,RHS1
      COMMON /CPRENT/ XIPRT(2)
      COMMON/QSHKPT/ SHKPRT
      LOGICAL SHKPRT
      COMMON /CTKEPR/ XTKEPR,XTKESH,XTKESF
      COMMON /CRESET/ XRESET(2)
      COMMON /COLDPT/ OLDPT(23,2),OLDPTS(2)
      COMMON /CSHKPT/ SHKPT(23,2)
      DIMENSION B(100),PSI(200),PTOT(200),ED(200),XMACH(200)
      COMMON/COMPIL/       PF,B,NXTA,GCJ,EJET,VJET,PTJET
     X                  ,NPD,PSI,PTOT,ED,XMACH
      COMMON /CLSPF / I

      SHKPRT=.FALSE.
   90 CONTINUE
      CALL OVERLAY(7HSSNOISE,2,1,6HRECALL)
      IF( ERR ) RETURN
      CALL OVERLAY(7HSSNOISE,2,2,6HRECALL)
      IF(ERR)  RETURN
      END
```

```
*DECK BLKSSD
      BLOCK DATA
      COMMON /CPI    / PI,TWOPI
      COMMON /CSTOR2/ DX1,SGN,I1,IEND(4)
      COMMON /CSHK   / TANS1,DSHOCK,PSISHK,DELP,DELVQU,
     *                 JLOW,JSHOCK,XSHOCK(2),YSHOCK
      COMMON/CBNDRY/ RHO(46),P(46),U(46),Y(46),VQU(46),PSI(46),
     * R(46),YBAR(46),RHOBAR(46),UBAR(46),VQUBAR(46),RBAR(46),
     * PBAR(46),PSI2(2),ZMN(46),PROUND(4),DX,RNJ,JT,RC,DXQDSY,
     * PSI1,YCALC,SLOPE(4),ITSAVE(2)
      COMMON /CLOGIC/ PCONT(4),DUAL,SLIP,AXISYM,SSTRM,
     *                BARPRT,ENDJOB,SOLID(4)
      COMMON /CINIT / NJJ(2),NJJM1(2),NJJM2(2),STABIL,
     *                X,XL,IPRINT,DX2,DX3,TS,DPSI(2)
      COMMON /CGAM  / GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1Q2(2)
      COMMON /CINPUT/ PT(80),TT(2),PRESS(80),YIN(80),ZM(80),
     * THETA(80),TANTH(80),XLOW(40),YLOW(40),XUP(40),YUP(40),
     * NSTRM(2),NPTSL(2),NPTSU(2),PUP(40),PLOW(40)
      COMMON /CJLBYS/ JLBDYS(2)
      LOGICAL AXISYM,SSTRM,DUAL,BARPRT,PCONT,SOLID
      COMMON /CXDISC/ XMDISC,XSAVE,IDISC,MDISCC
      LOGICAL MDISCC
      COMMON /CMLIM/ ZMLIM
      COMMON /CBDYPR/ XBDY(4)
      COMMON /CXPR  / XPR(4)
      COMMON /CTKEPR/ XTKEPR,XTKESH,XTKESF
      COMMON /CPRENT/ XENTRO(2)
      COMMON /CRESET/ XRESET(2)
      COMMON /CCHARL/ YCHARL
      COMMON /CSHFR / IFIRST,HUGE
      COMMON /CSHK2 / IFIRTT,II
      COMMON /CENTRO/ PTOT(20,46),XPT(20),PSIPT(46)
      COMMON /CSHOCK/ DUMSK(90),R2(10)
      COMMON /CRFLCT/ IGO,ICHNG,ISIGN
C
C
      DATA R2/10*0./
      DATA IGO,ICHNG/0,0/
      DATA JLBDYS/2*1/
      DATA JT,DX1,I1,XSHOCK,SGN,X,DX3,RC,XL/
     * 1,1.,1,2*1.E+6,1.,1.E+15,2*1.,1.E+15/
      DATA PI,TWOPI/3.14159,6.28318/
      DATA STABIL,IPRINT/.5,1/
      DATA AXISYM,SSTRM,DUAL,BARPRT,PCONT,SOLID/12*F/
      DATA PROUND,PT/4*1.E+15,80*1.E+15/
      DATA YIN/80*1.E+15/
      DATA XLOW,YLOW,XUP,YUP/40*1.E+15,40*1.E+15,40*1.E+15,40*1.E+15/
      DATA PUP,PLOW/40*1.E+15,40*1.E+15/
      DATA GAMMA,NJJ/2*1.4,2*21/
      DATA PSIPT,XPT/46*1.E+15,20*1.E+15/
      DATA XTKEPR,XTKESH,XTKESF/3*100./
      DATA XRESET/2*100./
      DATA XENTRO/2*100./
      DATA ZMLIM/1.04/
      DATA XBDY/4*100./
      DATA XPR/4*100./
```

```
      DATA XMDISC,XSAVE,MDISCC/2*1.E+15,F/
      DATA IFIRTT/1/,II/1/,YCHARL/1./,IFIRST/3/,HUGE/1.E+8/
C
      END
```

```
*DECK ERROR1S
      SUBROUTINE ERROR1
CERROR1 SET ERROR INDICATOR
      COMMON/TROUBL/ ERR,ENDJOB
      LOGICAL        ERR,ENDJOB
      ERR    = .TRUE.
      RETURN
      END
```

```
*DECK LFITSS
      SUBROUTINE LFIT(X,Y,NPTS,XC,YC,NXC,ND)
CLFIT          INTEGRATE OR INTERPOLATE
*     INTEGRATE OR INTERPOLATE USING A STRAIGHT LINE FIT BETWEEN POINTS

C*  CHECK TO KEEP -LFIT- FROM EXTRAPOLATION--
C*  IF REQUESTED INTERPOLATION LOCATION IS OUTSIDE DEFINED INTERVAL, SET
C*  VARIABLE EQUAL TO END VALUE


      DIMENSION X(10),Y(10), XC(10),YC(10)

C     INPUT-
C      X, Y     PTS. ON CURVE
C     NPTS      NO. OF X
C     XC        LIST OF X AT WHICH CALC TO BE DONE
C     YC(1)     INTEGRATION CONSTANT IF ND=-1
C     NXC       NO. OF XC
C     ND        =0 TO GET COORD,  =1 TO GET 1ST DERIVATIVE,
C               =-1 FOR INTEGRATION

C     OUTPUT
C     YC        COORDINATE OR DERIVATIVE AT XC   OR
C               YC(IC)= INTEGRAL(Y*DX) FROM XC(1) TO XC(IC) WHERE IC=2,NX

C     NOTES
C      "X" MAY BE IN EITHER ASCENDING OR DESCENDING ORDER.
C      FOR INTEGRATION "XC" MUST BE IN THE SAME ORDER AS "X".
C      FOR INTERPOLATION NO SPECIAL ORDER IS REQUIRED.

      COMMON /CLSPF /  I
      LOGICAL  WITHIN

      N      = NPTS-1
      I      = MAX0(1,MIN0(I,N))
      IF (ND.EQ.(-1)) I=1
      ISAVE = 0
      SGN    = SIGN(1.,X(N+1)-X(1))

C     BEGIN INTERPOLATION LOOP FOR XC(IC)  IC=1,NXC
      IC     = 1

C  LOCATE APPROPRIATE INTERVAL
  100 WITHIN= .FALSE.
      NCOUNT= N
  102 IF (NCOUNT) 119,103,103
  103 NCOUNT= NCOUNT-1
      XI     = X(I)
      XD     = XC(IC)-XI
      IF (N) 104,120,104
  104 IF (SGN*XD)105,107,110

C     F.LT.O. (F IS THE FRACTIONAL POSITION IN THE INTERVAL)
```

```
  105 IF (I.EQ.1) GO TO 117
C*105 IF (I.EQ.1) GO TO 120

      IF (ND.EQ.(-1)) GO TO 119
      I       = I-1
      GO TO 102

C     F.EQ.0.
  107 IF (X(I+1).NE.XI) GO TO 120
      GO TO 116
C     F.GT.0.
  110 IF (SGN*(XC(IC)-X(I+1))) 120,112,114

C     F.EQ.1.,  CHECK FOR INTEGRATION AND DOUBLE POINT BEFORE INCREMENTIN
  112 IF ((ND.EQ.(-1)) .OR. (I.NE.N .AND. X(I+1).EQ.X(I+2))) GO TO 120

C     F.GT.1.

  114 IF (I.EQ.N) GO TO 118
C*114 IF (I.EQ.N) GO TO 120

      IF (ND.EQ.(-1)) GO TO 122
  116 I       = I+1
      GO TO 102

C* EXTRAPOLATION OUTSIDE X-TABLE---USE END VALUES
  117 YI=Y(1)
      GO TO 1181

  118 YI=Y(N+1)
 1181 B=0.

      GO TO 129

  119 CALL ERROR1

C     PRELIMINARY CALCULATIONS FOR INTERPOLATION OR INTEGRATION
  120 WITHIN= .TRUE.
  122 IF (I-ISAVE) 124,129,124
  124 ISAVE = I
      YI      = Y(I)
      X3      = X(I+1)-XI
      B       = 0.
      IF (N.GT.0 .AND. X3.NE.0.) B=(Y(I+1)-YI)/X3
  129 IF (ND) 130,140,141

C     ND=-1, INTEGRATE
```

```
  130 IF (.NOT.WITHIN) XD=X3
      S1    = (YI+.5*B*XD)*XD
      IF (WITHIN) GO TO 135
C     "I" IS BEING INCREMENTED TO FIND APPROPRIATE INTERVAL.  HENCE,
C      CUMULATE THE INTEGRAL OF THE ITH INTERVAL.
      SA    = SA+S1
      GO TO 116
C     APPROPRIATE INTERVAL FOUND.  X(I)-XC(IC)-X(I+1)
  135 IF (IC.EQ.1) SA=YC(IC)-S1
      IF (IC.NE.1) YC(IC)=SA+S1
      GO TO 150
C     ND=0,  INTERPOLATE FOR COORDINATES
  140 YC(IC) = YI+B*XD
      GO TO 150
C     ND=1,  FIRST DERIVATIVE
  141 YC(IC) = B

  150 IC    = IC+1
      IF (NXC-IC) 900,160,160
  160 IF (ND.NE.(-1) .AND. XC(IC).EQ.XC(IC-1)) I=I+1
      GO TO 100

  900 RETURN
      END



*DECK LSPFSS
CLSPFITT DUMMY
      SUBROUTINE LSPFIT(X,Y,NPTS,XC,YC,NXC,ND)
      DIMENSION X(1),Y(1),XC(1),YC(1)
      CALL LFIT(X,Y,NPTS,XC,YC,NXC,ND)
      RETURN
      END



*DECK SSFDIN
      OVERLAY(SSNOISE,2,1)
      PROGRAM SSFDIN

C     MAIN PROGRAM FOR INPUT LINK

      CALL INIT
      CALL READT1
      RETURN
      END
```

```
*DECK INIT
      SUBROUTINE INIT
*INIT           SETS UP INITIAL CONDITIONS                     -INIT--
      COMMON /TROUBL/ ERR,ENDJOB
      LOGICAL ERR
      COMMON/FILK/CSC
      COMMON/CUPDAT/MAP,IMAP,NDIGIT(14)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),           R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2),TISAVE(1,2)
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,DUMEND
C     COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,ENDJOB
     1,SOLID(2,2)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CINPUT/ PT(40,2),TT(1,2),PRESS(40,2),YIN(40,2),ZM(40,2)
     1,THETA(40,2),TANTH(40,2),XLOW(20,2),YLOW(20,2),XUP(20,2),YUP(20,2)
     2,NSTRM(2),NPTSL(2),NPTSU(2),PUP(20,2),PLOW(20,2)
      COMMON /CBITS/ BITS,BLANK
      COMMON /CENTRO/ PTOT(20,46),XPT(20),NPT,DUM45(45)
      COMMON /CXPR/ XPR(4)
      COMMON /CXDISC/ XMDISC,XSAVE,IDISC,MDISCC
      COMMON /CBDYPR/ XBDY(4)
      COMMON /CPUNCH/ IPUNCH
      COMMON/QSHKPT/ SHKPRT
      LOGICAL SHKPRT
      COMMON /CRESET/ XRESET(2)
      COMMON /CPRENT/ XENTRO(2)
      COMMON /CTKEPR/ XTKEPR,XTKESH,XTKESF
      COMMON /CXLC  / XLC
      COMMON /CJDUM1/ DUMJMX(2038)
      DIMENSION XPTSET(20)
      LOGICAL MDISCC
      LOGICAL SLIP,SOLID,RSTART,EVEN
      LOGICAL AXISYM,DUAL,SSTRM,PCONT,BARPRT,ENDJOB
      NAMELIST /OUTPUT/ GAMMA,    STABIL,X,XL,BARPRT,AXISYM
     2 ,IPRINT,SSTRM,NJJ,EVEN
     * ,XLC,DUMJMX,JT
      NAMELIST /INPUT/ GAMMA,NJ,STABIL,X,XL,BARPRT,AXISYM
     2 ,IPRINT,SSTRM,NJJ,RSTART,TANTH
     3    ,ZM,PRESS,THETA,YIN,PT,TT
     4,XLOW,YLOW,XUP,YUP,PUP,PLOW
C    5  ,PTOT,XPT,PSIPT,YBAR,IPRTC
     5  ,PTOT,XPT,PSIPT,YBAR,IPRTC,NPT,CSC,NDIGIT
     6,IPUNCH,XBDY,XPR,XMDISC,XSAVE,IDISC,MDISCC
     7,SHKPRT,XTKESH,XTKESF,XRESET,XENTRO,XTKEPR
     * ,XMACH
      DATA XPTSET/0.,.1,.2,.3,.4,.5,.7,1.,2.,2.5,3.,4.,
     *             5.,6.2,7.5,9.,11.,13.,15.,20./

      DATA RSTART /.FALSE./,IPRTC /0/
C*  RSTART.EQ..TRUE.  IMPLIES THETA IS BEING READ IN AS TAN THETA--
C*  I.E., IT IS VEING OBTAINED FROM THE PRINTOUT OF A PREVIOUS RUN
```

```
      II=1
      DX3=1.E8
      EVEN=.TRUE.
      YBAR(1,1)=BITS
      YBAR(1,2)=BITS
      ERR=.FALSE.
      AXISYM= .TRUE.
      XUP(1,1)= 0.
      XUP(1,2)= 0.
      YLOW(1,1)= 0.
      YLOW(1,2)= .3162
      XLOW(1,1)=0.
      XLOW(1,2)=0.
      YUP(1,1)= .3162
      YIN(1,1)= 0.
      YIN(2,1)= .3162
      YIN(1,2)= .3162
      YIN(2,2)= 1.
      THETA(1,1)= 0.
      THETA(2,1)= 0.
      THETA(1,2)= 0.
      THETA(2,2)= 0.
      PT(1,1)= 1.
      PT(2,1)= 1.
      PT(1,2)= 1.
      PT(2,2)= 1.
      TT(1,1)= 1.
      TT(1,2)= 1.
      SSTRM = .TRUE.
      NJJ(1)= 8
      NJJ(2)= 19
      XMACH = 1.05
      XL    = BITS
      NPT   = 0
      CALL SETM(1,BITS,XPT,20)
   20 READ (5,INPUT)
      IF(ERR) RETURN
      IF( XPT(1).NE.BITS ) GO TO 2222
      NPT   = 20
      CALL MOVE(1,XPTSET,XPT,20,1)
 2222 ZM(1,1)= XMACH
      ZM(2,1)= XMACH
      ZM(1,2)= XMACH
      ZM(2,2)= XMACH
      CALL READT

      JT    = 1
      IF (YBAR(1,JT).NE.BITS) EVEN=.FALSE.
C*  EVEN=.TRUE.  IMPLIES EVENBY SPACED (IN PSI) MESH
C*  EVEN=.FALSE.  IMPLIES USE THE Y-SPACING AS GIVEN IN THE YBAR TABLE

CC -Y- REPRESENTS THE Y-COORSINATES OF THE ENENLY SPACED CRSSS-STREAM
C* VARIABLES
C* -X-   INITIAL VALUE OF X-COOR WHERE CALC IS TO START
C* -XL   FINAL VALUE OF X-COOR WHERE IS TO END
```

```
C* -PCONT-  TRUE INPLIES A PRESSURE BOUNDAR Y
C* -SSTRM- TRUE IMPLIES THE BOUNDARY BETWEEN THE 2 CHANNELS IS A SLIPSTR
C* -ZM-     CROSS-STREAM MACH NUMBER VARIATION
C*      --INPUT QUANTITIES--
C* -PRESS- CRISS STREAM PRESSURE VARIATION
C* -THETA- CROSS STREAM- FLOW ANGLE VARIATION
C* -YIN-    Y-COOR FIR CROSS STREAM PROPERTIES (ASSUMES CONSTANT X)
C* -PT-     TOTAL PRESSURE OF INLET STREAM (VARIABLE)
C* -TT-     TOTAL TEMPERATURE OD INLET STREAM (CONSTANT FOR EACH STREAM)
C* -XLOW-   -YLOW-  X AND Y COORDINATES OF LOWER BOUNDARY (FOR EACH CHANN
C* -XUP-   YUP-  X AND Y COORDINATES FOR UPPER BOUNDARIES
C* -NJ-     NUMBER OF EVENLY SPACED CROSS-STREAM POINTS USED FOR CALCULAT

   47 DO 48 J=1,41
      IF(XUP(J,JT).EQ.BITS) GO TO 49
   48 CONTINUE

   49 NPTSU(JT)=J-1
      DO 50 J=1,41
      IF(XLOW(J,JT).EQ.BITS) GO TO 51
   50 CONTINUE
   51 NPTSL(JT)=J-1

      DO 52 J=1,81
      IF(YIN(J,JT).EQ.BITS) GO TO 53
   52 CONTINUE
   53 NSTRM(JT)=J-1
      IF (NSTRM(JT).GT.1) GO TO 54
      NSTRM(JT)=NSTRM(JT)+1
      PRESS(2,JT)=PRESS(1,JT)
      ZM(2,JT)=ZM(1,JT)
      THETA(2,JT)=THETA(1,JT)
      PT(2,JT)=PT(1,JT)
      YIN(2,JT) =YUP(1,JT)
   54 NSTRM1=NSTRM(JT)
      PBOUND(1,JT)=PLOW(1,JT)
      PBOUND(2,JT)=PUP(1,JT)

      HUGE=1.E8
      IF (NPTSL(JT) .NE.1) GO TO 57
C* IF ONLY ONE VALUE IS INPUT, ASSUME LINEAR DISTRIBUTION
      XLOW(2,JT)=HUGE
      YLOW(2,JT)=YLOW(1,JT)
      PLOW(2,JT)=PLOW(1,JT)
      NPTSL(JT)=2
   57 IF (NPTSU(JT) .NE.1) GO TO 59
      XUP(2,JT)=HUGE
      YUP(2,JT)=YUP(1,JT)
      PUP(2,JT)=PUP(1,JT)
      NPTSU(JT)=2
   59 GAMI(JT)=1./GAMMA(JT)
      GAM1(JT)=GAMMA(JT)-1.
      GAM2(JT)=2.*GAMMA(JT)/GAM1(JT)
      GAM1QG(JT)=GAM1(JT)*GAMI(JT)
      EXPON=1./GAM1QG(JT)
      NJJM1(JT)=NJJ(JT)-1
```

```
      NJJM2(JT)=NJJ(JT)-2
      NJ=NJJ(JT)
      NJM1=NJJM1(JT)
      NJM2=NJ-2
      IF(IPRTC.NE.0)
     1WRITE (6,8) NPTSL(JT),NPTSU(JT),NSTRM(JT)

C          PLANAR CASES ----    RC = 0.
C          AXISYMMETRIC CASES-----  RC=1.
C*         RC IS PRESET TO 1.0 IN BLOCK DATA

      IF (X.NE.BITS) GO TO 60
      IF (XLOW(1,JT).NE.BITS) X=XLOW(1,JT)
      IF (XUP(1,JT).EQ.BITS) GO TO 60
      IF (XUP(1,JT).GT.XLOW(1,JT)) X=XUP(1,JT)

C*         LOWER BOUNDARY

   60 K=1
      IF (SSTRM.AND.JT.EQ.2) GO TO 205
      IF (PBOUND(K,JT).EQ.BITS) GO TO 80

C*         LOWER BOUNDARY IS CONSTANT PRESSURE BOUNDARY

      IF (X.EQ.BITS) X=0.
      YBAR(1,JT)=YIN(1,JT)
      PCONT(K,JT)=.TRUE.
      IF (YLOW(1,JT).NE.BITS) GO TO 805
      GO TO 81
   80 IF (NPTSL(JT).EQ.0) GO TO 201

C*         LOWER BOUNDARY IS SOLID WALL

  805 SOLID(K,JT)=.TRUE.
      CALL LSPFIT(XLOW(1,JT),YLOW(1,JT),NPTSL(JT),X,YBAR(1,JT),1,0)

C*         UPPER BOUNDARY

   81 K=2
      DUAL=.TRUE.
C* SET DUAL=T BOTH TIMES THROUGH, FOR JT=1,2.  IF NO UPPER CHA NNEL IS
C* INPUT, DUAL WILL BE RESET TO FALSE
      R(1,JT)=YBAR(1,JT)
      IF (PBOUND(K,JT).EQ.BITS) GO TO 90

C*         UPPER BOUNDARY IS CONSTANT PRESSURE BOUNDARY

      PCONT(K,JT)=.TRUE.
      YBAR(NJ,JT)=YIN(NSTRM1,JT)
      IF (YUP(1,JT).NE.BITS) GO TO 905
      GO TO 91
   90 IF (NPTSU(JT).EQ.0) GO TO 202

C*         UPPER BOUNDARY IS SOLID WALL
  905 SOLID(K,JT)=.TRUE.
```

```
      CALL LSPFIT (XUP(1,JT),YUP(1,JT),NPTSU(JT),X,YBAR(NJ,JT),1,0)
   91 DY=(YBAR(NJ,JT)-YBAR(1,JT))/FLOAT(NJM1)

      IF (IPRTC.NE.0) WRITE (6,OUTPUT)
      IF (NSTRM(JT).LT.2) GO TO 203

      I=1
      IF (TT(II,JT).NE.BITS) GO TO 92
      TT(II,JT)=TS*(1.+ZM(I,JT)*ZM(I,JT)*GAM1(JT)*.5)
   92 IF (AXISYM) GO TO 95
      R(1,JT)=1.0
      RC=0.0

   95 IF (PT(I,JT).EQ.BITS) GO TO 98
C* TOTAL PRESSURE INPUT
      DO 96 I=1,NSTRM1
      PRESS(I,JT)=PT(I,JT)*(1.+ZM(I,JT)*ZM(I,JT)*GAM1(JT)*.5)
     1  **(-GAMMA(JT)/GAM1(JT))
      IF(RSTART) GO TO 96
      TANTH(I,JT)=SIN(THETA(I,JT))/COS(THETA(I,JT))
   96 CONTINUE
      GO TO 99

   98 CONTINUE
C*  STATIC PRESSURE INPUT
      DO 911 I=1,NSTRM1
      PT(I,JT)=(1.+ZM(I,JT)*ZM(I,JT)*GAM1(JT)*.5)**(GAMMA(JT)/GAM1(JT))
     1*PRESS(I,JT)
      IF(RSTART) GO TO 911
      TANTH(I,JT)=SIN(THETA(I,JT))/COS(THETA(I,JT))
  911 CONTINUE

   99 DO 100 J=1,NJM1
      IF (EVEN) YBAR(J+1,JT)=YBAR(J,JT)+DY
  100 R(J+1,JT)=YBAR(J+1,JT)*RC+(1.-RC)

C         -NSTRM- IS THE NUMBAR OF STEEAMLINES WHICH IS BEING INPUT
C         -NPTS-  IS THE NUMBER OF POINTS IN THE BOUNDARY TABLE


      CALL LSPFIT(YIN(1,JT),ZM(1,JT),NSTRM1,YBAR(1,JT),RHOBAR(1,JT),NJ,0
     1)
      CALL LSPFIT(YIN(1,JT),TANTH(1,JT),NSTRM1,YBAR(1,JT),VQUBAR(1,JT)
     1  ,NJ,0)
      CALL LSPFIT(YIN(1,JT),PRESS(1,JT),NSTRM1,YBAR(1,JT),PBAR(1,JT)
     1 ,NJ,0)

      DO 105 J=1,NJ
      TS=TT(II,JT) /(1.+GAM1(JT)*.5* RHOBAR(J,JT)*RHOBAR(J,JT))
      RHO(J,JT)=PBAR(J,JT)/TS
      U(J,JT)=RHOBAR(J,JT)*SQRT(GAMMA(JT)*PBAR(J,JT)/RHO(J,JT))
      U(J,JT)=U(J,JT)/SQRT(1.+VQUBAR(J,JT)*VQUBAR(J,JT))
  105 RBAR(J,JT)=RHO(J,JT)*U(J,JT)*R(J,JT)
```

```
C         TEMPORARILY ST/RE INTEGRAND IN -RBAR- LOCATION

C         TABULATE PSI VERSUS Y AT EVEN INTERVALS OF Y.  STORE IN -UBAR-
      UBAR(1,JT) =0.0
      IF (JT.EQ.2) UBAR(1,JT)=PSI(NJ1,1)
      CALL LSPFIT (YBAR(1,JT),RBAR(1,JT),NJ,YBAR(1,JT),UBAR(1,JT),NJ,-1)

      IF (IPRTC.EQ.0) GO TO 112
      CALL TABPRT (3HZMN,RHOBAR(1,JT),NJ,10)
      CALL TABPRT (5HTANTH,VQUBAR(1,JT),NJ,10)
      CALL TABPRT (5HPRESS,PBAR(1,JT),NJ,10)
      CALL TABPRT (5H YBAR,YBAR(1,JT),NJ,10)
      CALL TABPRT (3HPSI,UBAR(1,JT),NJ,10,0)

C         FIRST VALCULATE DELTA PSI ACROSS THE ENTIRE STREAM BY USING RQU
C         INCREMENTS IN Y.  THEN TABULATE PSI AT EVEN INTERVALS OF Y (AND
C         STORE IN -UBAR- LOCATION).  FINALLY  TBULATE ALL PARAMETERS AT
C         EVEN INTERVALS OF PSI FOR EASE OF CALCULATION.

  112 PSI1=UBAR(NJ,JT)-UBAR(1,JT)
      IF (.NOT.EVEN) GO TO 128
      DPSI(JT)=PSI1/FLOAT(NJM1)

      PSI(1,JT)=UBAR(1,JT)
      DO 120 J=2,NJ
  120 PSI(J,JT) = PSI(J-1,JT) + DPSI(JT)

      CALL LSPFIT (UBAR(1,JT),VQUBAR(1,JT),NJ,PSI(1,JT),VQU(1,JT),NJ,0)
      CALL LSPFIT (UBAR(1,JT),YBAR(1,JT),NJ,PSI(1,JT),Y(1,JT),NJ,0)
      CALL LSPFIT (UBAR(1,JT),  PBAR(1,JT),NJ,PSI(1,JT),P(1,JT),NJ,0)
      CALL LSPFIT (UBAR(1,JT),RHOBAR(1,JT),NJ,PSI(1,JT),ZMN(1,JT),NJ,0)
      GO TO 130

  128 DO 129 J=1,NJ
      PSI(J,JT)=UBAR(J,JT)
      Y(J,JT)=YBAR(J,JT)
      P(J,JT)=PBAR(J,JT)
      VQU(J,JT)=VQUBAR(J,JT)
  129 ZMN(J,JT)=RHOBAR(J,JT)
  130 DPSI(JT)=PSI(2,JT)-PSI(1,JT)

      IF (IPRTC.EQ.0) GO TO 135
      CALL TABPRT (3H  Y,  Y(1,JT),NJ,10)
      CALL TABPRT (3H  P,  P(1,JT),NJ,10)
      CALL TABPRT (3HVQU,VQU(1,JT),NJ,10)
      CALL TABPRT (3HZMN,ZMN(1,JT),NJ,10)
      CALL TABPRT (3HPSI,PSI(1,JT),NJ,10,0)

  135 DO 140 J=1,NJ
      TS =TT(II,JT)/(1.+GAM1(JT)*.5*ZMN(J,JT)*ZMN(J,JT))
      RHO(J,JT)=P(J,JT)/TS
      U(J,JT)=ZMN(J,JT)*SQRT(GAMMA(JT)*P(J,JT)/(RHO(J,JT)*(1.+VQU(J,JT)
     1*VQU(J,JT))))
      PT(J,JT)=P(J,JT)*(1.+GAM1(JT)*.5*ZMN(J,JT)*ZMN(J,JT))**EXPON
      IF (J.NE.NJ) DPSI(JT)=PSI(J+1,JT)-PSI(J,JT)
  140 R(J,JT)=Y(J,JT)*RC+1.-RC
```

```
      IF (IPRTC.EQ.0) GO TO 150
      CALL TABPRT (3HRHO,RHO(1,JT),NJ,10)
      CALL TABPRT (3H  U,  U(1,JT),NJ,10)
      CALL TABPRT (2HPT,PT(1,JT),NSTRM1,10,0)

  150 TTSAVE(II,JT)=TT(II,JT)
      IF (JT.EQ.2) GO TO 160
      JT=2
      GO TO 47

C*  SET UP NJ VALUES TO PRECLIDE ERROR IN FIRST STEP IN **SSFD**
  160 VQUBAR(NJ,JT)=VQU(NJ,JT)
      YBAR(NJ,JT)=Y(NJ,JT)
      PBAR(NJ,JT)=P(NJ,JT)
      RHOBAR(NJ,JT)=RHO(NJ,JT)
      UBAR(NJ,JT)=U(NJ,JT)
      GO TO 180

  201 IF (JT.EQ.2) GO TO 179
      WRITE (6,1)
      WRITE (6,9)
      GO TO 178
  202 WRITE (6,2)
      WRITE (6,9)
      GO TO 178
  203 WRITE (6,3)
      WRITE (6,9)
      GO TO 178

C*  SET UP LOWER BOUNDARY FOR SSTRM-DUAL FLOW CASE
  205 NJ1=NJJ(1)
      SOLID(2,1)=.FALSE.
      PCONT(2,1)=.FALSE.
      YBAR(1,2)=YBAR(NJ1,1)
      YIN(1,2)=YBAR(NJ1,1)
      GO TO 81

C* IF NO BOUNDARIES ARE UPPER STREAM ARE INPUT, DUAL IS FALEE
  178 ERR   = .TRUE.
  179 DUAL=.FALSE.
  180 RETURN
    1 FORMAT (1X,51HINPUT ERROR---NO LOWER BOUNDARY HAS BEEN SPECIFIED )
    2 FORMAT (1X,51HINPUT ERROR---NO UPPER BOUNDARY HAS BEEN SPECIFIED )
    3 FORMAT (1X,57HINPUT ERROR---NO INITIAL STREAMLINES HAVE BEEN SPECI
     1FIED  )
    8 FORMAT (1X,4HNPTS,5I10)
    9 FORMAT (1X,57HTHIS CASE IS BEING TERMINATED, NEXT CASE WILL BE REA
     1D IN  )
      END
```

```
*DECK READT
      SUBROUTINE READT
*READT

      LOGICAL FOUND,DUAL,BARPRT
      COMMON/CLOGIC/DUM2(4),DUAL,DUM6(3),BARPRT
      COMMON/CBNDRY/DUM1(230),PSI1(23,2)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,XDUM,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)

      COMMON /TKEIN/ XTKE(20),TKEBDY(20),NTKE,XLTKE(20),MJET,X(100),
     1 TIJET,TJET,DIAJ
      COMMON /CENTRO/ PTOTJ(20,46),XPT(20),NPT,DUM45(45)
      COMMON/CINPUT/PTINP(40,2),DUM3(162),ZM(40,2),DUM4(326),PUP(20,2),
     X  DUM5(40)

      COMMON/TROUBL/ ERR,ENDJOB
      LOGICAL        ERR,ENDJOB
      INTEGER ORGF,UPDF,NEWF,SCRF
      COMMON/FILES/ORGF,UPDF,NEWF,SCRF
      COMMON/FILK/CSC
      COMMON/KEYS/KEY(11),KEYB(11),KODA(11),KODB(11)
      COMMON /CNTROP/ RHS2  ,RHS,RHS1
      COMMON /CPRENT/ XIPRT(2)
      COMMON /COLDPT/ OLDPT(23,2),OLDPTS(2)
      COMMON /CSHKPT/ SHKPT(23,2)
      COMMON /CBITS / BITS,BLANK
      COMMON /CJDUM1/ NAME(10),TITLE(10),IDENT(10),
     * ADDRES(10),IDENT1(10),
     * TWODT(9),DBITS,DERR,GC,     FOOT,VE,ME,TIE,TE,AXI,NJ,NM,UE,
     * MIXPRE,FLOWJ,MERGE,NV,CON1,CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,
     * CTP,CTS,CTM,GAM,RG,PR,PRT,SC,TREF,MUREF,SP,SLEN,DPRIN,PLOT,
     * C6,MIX,CF,MAXIT,TOL,SUPB,
     * XPRN(100),UC(100),TC(100),TIC(100),PTC(100),
     * WJ(100),YJ(100),TTC(100),YSONIC(100),YCB(100),XD(100),RD(100),
     * YR(100),YCD(100),PD(100),WV(100),MA2(100),VE2(100),TE2(100),
     * ID,NC,CNAME(6),ALJ(6),ALJO(6),ALE(6),SCM(6),DIFF
      COMMON /CJDUM2/ NREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * Y(200),UD(200),THD(200),TID(200),RHO(200),U(200),T(200),
     * TOT(200),TTD(200),PTD(200),MOLF1(200),MOLF2(200),MOLF3(200),
     * MOLF4(200),MOLF5(200),MOLF6(200),JD
      COMMON/CXLC  / XLC

      DIMENSION XLN(200),PSI(200),PTOT(200),ED(200),XMACH(200)
      DIMENSION B(100)
      DIMENSION PSIPT(200)
      DIMENSION PTNEW(200)
      REAL MJET
      COMMON/COMPIL/       PE,B,NXTA,GCJ,EJET,VJET,PTJET
     X                ,NPD,PSI,PTOT,ED,XMACH

C     READ CENTERLINE RECORD FROM JETMIX
      ASSIGN 10 TO LGO
    1 READ (2) KXX1,KREC,
     * NAME,TITLE,IDENT,ADDRES,IDENT1,
```

```
     * TWODT   ,
     * DBITS,DERR,GC,GCJ,FOOT,
     * DIAJ,MJET,TJET,FTJET,VJET,TIJET,EJET,
     * PE,VE,ME,TIE,TE,AXI,NJ,NM,
     * UE,MIXPRE,XLC,FLOWJ,MERGE,NV,CON1,
     * CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CTP,CTS,CTM,
     * GAM,RG,PR,PRT,SC,TREF,MUREF,SP,SV,SLEN,DPRIN,PLOT,
     *C6,MIX,CF,MAXIT,TOL,SUPB ,
     *X,XPRN,B,UC,TC,TIC,PTC,WJ,YJ,TTC,
     * YSONIC  ,
     *YCB,XD,RD,YR,YCD,PD,WV,MA2,VE2,TE2,NXTA,ID,
     *NC,CNAME,ALJ,ALJO,ALE,SCM,DIFF
      GO TO LGO , (10,20)
   10 IF( XL.EQ.BITS ) XL=XLC
      XL     = 2.*XL
      DO 15  I=1,2
   15 PUP(I,2)=PE/PTJET
      RETURN

      ENTRY READT1

* CALCULATE DELTA PSI FOR SSFD VALUES
      SCALE = PTINP(1,1)/PTJET
      NJ=NJJ(1)
      DELPS1=PSI1(NJ,1)-PSI1(1,1)
      NJ=NJJ(2)
      DELPS2=0.
      IF(DUAL)  DELPS2=PSI1(NJ,2)-PSI1(1,2)

      IJ=1
      ASSIGN 20 TO LGO
   20 DO 100 I=1,NXTA

* READ STATION RECORD FROM JETMIX FILE
      READ (2) JREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,ED,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,JD
      IF( X(I).NE.XPT(IJ) ) GO TO 100

* SET JETMIX DELTA PSI AND INITIAL STATION PT AND MACH
      IF(IJ .GT. 1)  GO TO 40
      DPSIPT=PSI(NPD)-PSI(1)
      PSIRAT=(DELPS1+DELPS2)/DPSIPT
      DO 25  L=1,NPD
      PTOT(L)=PTJET
   25 XMACH(L)=MJET
      GO TO 45

* TEST WHETHER SONIC LINE IS NEARING CENTERLINE
   40 CALL LSPFIT(XMACH,PSI,NPD,1.1,PSIBDY,1,0)
      IF(PSIBDY .LT. .1*DPSIPT)  GO TO 150

   45 XPT(IJ)=2.*X(I)
      XTKE(IJ)=XPT(IJ)
      XLTKE(IJ)=12.*2.*XLN(1)/DIAJ
```

```
* CONVERT ENERGIES TO INTENSITIES AND SCALE PT VALUES
      DO 50  L=1,NPD
   50 PTOT(L)=PTOT(L)*SCALE

* SCALE JETMIX PSI VALUES TO SSFD VALUES
      DO 55  L=1,NPD
   55 PSIPT(L)=PSI(L)*PSIRAT

* INTERPOLATE TO GET VALUES OF PT AT SSFD PSI VALUES
      JSTART=1
      JTT=1

   60 NJ=NJJ(JTT)
      CALL LSPFIT(PSIPT,PTOT,NPD,PSI1(1,JTT),PTNEW(JSTART),NJ,0)
      JSM1=JSTART-1
      JEND=NJ+JSM1
      DO 65  J=JSTART,JEND
      JS=J-JSM1
      SHKPT(JS,JTT)= 0.
   65 PTOTJ(IJ,J)=PTNEW(J)

      IF(BARPRT)
     1WRITE(6,1054)  XPT(IJ),IJ,(PTOTJ(IJ,J),J=JSTART,JEND)
 1054 FORMAT(1X,F10.3,I4,(1X,4HPTOT,7F15.8))
      IF(.NOT. DUAL  .OR.  JTT .EQ. 2)  GO TO 70

      JSTART=NJ+1
      JTT=2
      GO TO 60
   70 CONTINUE

* FIND ED ON MACH = 1.1 LINE
      CALL LSPFIT(XMACH,ED,NPD,1.1,TKEBDY(IJ),1,0)
      GO TO 101

  100 CONTINUE
  101 IJ     = IJ+1
      IF( IJ.GT.NPT ) GO TO 150
      REWIND 2
      GO TO 1

  150 NTKE=IJ-1
      NPT=NTKE
      IF(XPT(NPT).LT.XL) XL=XPT(NPT)
      DO 175  I=1,NXTA
  175 X(I)=2.*X(I)
      RETURN

  200 WRITE(6,201)  X(I)
  201 FORMAT(///35H*** CANT FIND STATION DATA FOR X = ,F10.6)
      GO TO 275
  250 WRITE(6,251)
  251 FORMAT(///36H*** CANT FIND CENTERLINE DATA RECORD)
  275 ERR=.TRUE.
      RETURN
 9999 FORMAT(10F10.3)
```

```
      END
```

```
*DECK SSFDCA
      OVERLAY(SSNOISE,2,2)
      PROGRAM SSFDCA

C     MAIN PROGRAM FOR SS FLOW CALCULATION

      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,DUMEND
     1 ,SOLID(2,2)
      COMMON /CXDISC/ XMDISC,XSAVE,IDISC,MDISCC

C* IF PCONT IS FALSE SET SOLID .TRUE.8---IF NEITHER IS INPUT, PROGRAM AS
C* A SOLID WALL
C* IF PCONT IS .TRYE. THEN SOLID CAN BE EITHER TRUE OR FALSE

      DO 60 K=1,4
   60 IF (.NOT.PCONT(K,1)) SOLID(K,1)=.TRUE.
      SLIP=.FALSE.
      IF(.NOT.SSTRM) GO TO 70
C*  MAKE SURE SLIPSTREAM IX TREATED AS A SOLID BOUNDARY
      SOLID(2,1)=.TRUE.
      SOLID(1,2)=.TRUE.
   70 IF (IDISC.EQ.11) CALL RESTRT(4)

  110 CALL SSFDM
      IF (IDISC.EQ.2) CALL RESTRT(3)
      IF (IDISC.EQ.10) GO TO 120
      RETURN

C*  DATA HAS VEEN STORED AND FLOW IS BEING REDTARTED
  120 IDISC=-1
      GO TO 110
      END
```

```
*DECK BNDRY
      SUBROUTINE BNDRY(JJJ,JJ,J)
*BNDRY        USES MOC TO CALCULATE B.C.  **BNDRY**
      COMMON /CCRNER/ NPTSM1,KDUM,ICRNER,XCRNER
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2 ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3 ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4 ,PBOUND(2,2),DX,RNJ,JT,RC,DXODSY,PSI1,YCALC,SLOPE(2,2),TT(1,2)
      COMMON /CMLIM/ ZMLIM
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CSHK/ TANS1,DSHOCK,PSISHK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,ENDJOB
     1 ,SOLID(2,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      DIMENSION     VQUCH(1,2),RHOCH(1,2),UCH(1,2),YCH(1,2)
     1  ,PCH(1,2),RCH(1,2)
      COMMON /CNTROP/ RHS2  ,RHS,RHS1
      COMMON /CPTSLP/ XJUMP
      COMMON /CBDYPR/ XBDY(4)
      COMMON /CINPUT/ PT(40,2),DUMINP(648)
      DIMENSION      PHLD(6),UHLD(6),RHOHLD(6),VQUHLD(6),PSIHLD(6)
      DIMENSION VPSLCH(8),VPTSLP(4),VPTSL2(4)
      COMMON /CDPSIC/ DPSI1(2),DPSIC(2),PTPRE(2)
      LOGICAL PCONT,DUAL,SLIP,SOLID,DSHOCK,IADJ(2,2),AXISYM
      DATA IPRESS,ISOLID,IREGPT /6HIPRESS,6HISOLID,6HIREGPT/
      DATA IADJ /4*.FALSE./, KJT /1/
C        JJJ= NUMBER POINTS TO BE USED BY LSPFIT
C        JJ = IDEX  OF FIRST CELL IN X VECTOR AT WHICH INTERPOLATION
C        IS TO START.
C        J  = CELL IN WHICH COMPUTED VALUES ARE TO BE STORED
      IGO=-1
      KSHOCK=3
      JA=JT
      JHOLD=J
      JJHOLD=JJ
      I1D=0
      II=1
      IF (X.GT.XBDY(1).AND.XBDY(1).EQ.XBDY(2)) IPRINT=1
      ON1=0.

C*  ICRNER=-6 MEANS A DOWN SHOCK IS CROSSING A SLIP LINE
C*  ICRNER=-7 MEANS AN UP  SHOCK IS CROSSING A SLIP LINE
      IF ((ICRNER.EQ.(-6).OR.ICRNER.EQ.(-7)).AND.SLIP) ON1=1.
      YHOLD=YBAR(J,JT)
      PSIBDY=PSI(J,JT)
      NJJT=NJJ(JT)
      CALL ENTROP(1,J)
      JSHK=0
      IF (XSHOCK(JT).LE.X) JSHK=JSHOCK
C*  ICRNER=-5 IS A SIGNAL THAT A SUBSONIC-SUPERSONIC SLIP LINE IS BEING
C*  THIS TIME YHROUGH **BNDRY**  **ONEDIM** WILL BR CALLED
```

```
      IF (SLIP) GO TO 150
   50 IF (J.EQ.JLBDY) GO TO 88
C*  UPPER BOUNDARY
      K=2
      SGN=1.
      L=3
      KSGN=-1
      IF (ICRNER.EQ.(-6)) JA=2
      J2=J-2
      J1=J-1
      SGNSHK=1.
      IF (DSHOCK) GO TO 89
      L=4
      KSGN=1
      JSHK=JSHK+1
      SGNSHK=-1.
      IF (ICRNER.EQ.(-7)) ON1=1.
      GO TO 89

C*  SHOCK CROSSING SLOP LINE
   87 L=L-2
      PSISHK=PSISHK*1.003
      GO TO 89

C*  LOWER BOUNDARY
   88 SGN=-1.
      K=1
      L=4
      IF (ICRNER.EQ.(-4).OR.ICRNER.EQ.4) L=2
      J2=J+2
      J1=J+1
      KSGN=-1
C*  ADJUXT MEANING OF JSHK FOR LOWER BOUNDARY CASE
      SGNSHK=-1.
      IF (ICRNER.EQ.(-5).AND.JT.EQ.1) ICRNER=-9
      IF (ICRNER.EQ.(-7)) GO TO 87
      IF (.NOT.DSHOCK) GO TO 89
      JSHK=JSHK-1
      SGNSHK=1.
      L=3
      KSGN=1

C*  ADJUST QUANTITIES FOR SHOCKS NEAR A BOUNDARY
   89 ON2=0.
      ON3=0.
      IF (JSHK  .EQ.J1) GO TO 90
      IF (JSHK  .NE.J) GO TO 98
      KSHOCK=KSHOCK+KSGN
   90 KSHOCK=KSHOCK+KSGN
   92 DELP=P2(L,JA)-P1(L,JA)
      DELU=U2(L,JA)-U1(L,JA)
      DELRHO=RHO2(L,JA)-RHO1(L,JA)
      DELVOU=VOU2(L,JA)-VOU1(L,JA)
      GO TO 100
   98 IF (ON1.NE.0.) GO TO 92
  100 PHLD(KJT)=P(J,JT)+DELP*ON1
```

```
      PHLD(KJT+1)=P(J1   ,JT)+DELP*ON2
      PHLD(KJT+2)=P(J2   ,JT)+DELP*ON3
      UHLD(KJT)=U(J,JT)+DELU*ON1
      UHLD(KJT+1)=U(J1   ,JT)+DELU*ON2
      UHLD(KJT+2)=U(J2   ,JT)+DELU*ON3
      VQUHLD(KJT)=VQU(J,JT)+DELVQU*ON1
      VQUHLD(KJT+1)=VQU(J1   ,JT)+DELVQU*ON2
      VQUHLD(KJT+2)=VQU(J2   ,JT)+DELVQU*ON3
      PSIHLD(KJT)=PSI(J,JT)
      PSIHLD(KJT+1)=PSI(J1   ,JT)
      PSIHLD(KJT+2)=PSI(J2   ,JT)
      RHOHLD(KJT)=RHO(J,JT)+DELRHO*ON1
      RHOHLD(KJT+1)=RHO(J1   ,JT)+DELRHO*ON2
      RHOHLD(KJT+2)=RHO(J2   ,JT)+DELRHO*ON3
      GO TO (110,115,140,130,120),KSHOCK
C*   --KSHOCK=1--   A DOWN SHOCK IS WITHIN A SINGLE POINT OF AN UPPER BOUN
C*                  OR--AN UPSHOCK IS WITHIN A SINGLE POINT OF A LOWER BOU
C*   --KSHOCK=2--   A DOWN SHOCK IS WITHIN TWO POINTS OF AN UPPER BOUNDARY
C*                  OR--AN UPSHOCK IS WITHIN TWO POINTS OF A LOWER BOUNDAR
C*   --KSHOCK=3--   NO SHOCKS ARE NEAR THE BOUNDARY
C*   --KSHOCK=4--   A DOENSHOCK IS WITHIN TWO POINTS OF A LOWER BOUNDARY--
C*                  OR--AN UPSHOCK IS WITHIN TWO POINTS OF AN UPPER BOUNDA
C*   --KSHOCK=5--   A DOWNSHOCK IS WITHIN A SINGLE POINT OF A LOWER BOUNDA
C*                  OR--AN UPSHOCK IS WITHIN A SINGLE POINT OF AN UPPER BO
  110 KJTT=KJT+1
      PSIHLD(KJTT)=PSISHK
      PSIHLD(KJT+2)=2.*PSISHK-PSIHLD(KJT)
      PHLD(KJTT)=P2(L,JT)
      UHLD(KJTT)=U2(L,JT)
      VQUHLD(KJTT)=VQU2(L,JT)
      RHOHLD(KJTT)=RHO2(L,JT)
  115 KJTT=KJT+2
      PHLD(KJTT)=P2(L,JT)
      VQUHLD(KJTT)=VQU2(L,JT)
      UHLD(KJTT)=U2(L,JT)
      RHOHLD(KJTT)=RHO2(L,JT)
      GO TO 140
  120 KJTT=KJT+1
      PSIHLD(KJTT)=PSISHK
      PSIHLD(KJT+2)=PSIHLD(KJTT)*2.-PSIHLD(KJT)
      VQUHLD(KJTT)=VQU1(L,JT)
      UHLD(KJTT)=U1(L,JT)
      PHLD(KJTT)=P1(L,JT)
      RHOHLD(KJTT)=RHO1(L,JT)
  130 VQUHLD(KJT+2)=VQU1(L,JT)
      UHLD(KJT+2)=U1(L,JT)
      PHLD(KJT+2)=P1(L,JT)
      RHOHLD(KJT+2)=RHO1(L,JT)
  140 IF (X.GT.XBDY(2)) CALL TABPRT (4HPHLD,PHLD,30,6)
      IF (JJ.EQ.0) RETURN
C*  END OF SHOCK ADJUSTMENT
```

```
  150 VQUBAR(J,JT)=VQUHLD(KJT)
C*  USE -PCRIT- TO BE SURE FLOW IS STILL SUPERCEITICAL
      EXPON=-1./GAM1QG(JT)
      PCRIT=PT(J,JT)*((GAMMA(JT)+1.)*.5)**EXPON*.99999
      IF (ICRNER.EQ.(-9)) SLOPE(K,JT)=VQUBAR(J,JT)
      JHM1=JHOLD- 1
      IF (               .NOT.PCONT(K,JT)) VQUBAR(J,JT)=SLOPE(K,JT)
      PBAR(J,JT)=PHLD(KJT)
      IF (PCONT(K,JT)) PBAR(J,JT)=PBOUND(K,JT)

      DPSI1(JT)=.5*DPSI(JT)
  180 ICH=0
  195 PSI2(1,JT)=PSIBDY-DPSI1(JT)*SGN
      CALL LFIT   (PSIHLD(KJT),UHLD(KJT),JJJ,PSI2(1,JT),UCH(1,JT),1,0)
      CALL LFIT   (PSIHLD(KJT),PHLD(KJT),JJJ,PSI2(1,JT),PCH(1,JT),1,0)
      CALL LFIT (PSIHLD(KJT),VQUHLD(KJT),JJJ,PSI2(1,JT),VQUCH(1,JT),1,0)
      CALL LFIT (PSIHLD(KJT),RHOHLD(KJT),JJJ,PSI2(1,JT),RHOCH(1,JT),1,0)
      CALL LFIT   (PSI(JJ,JT),R(JJ,JT),JJJ,PSI2(1,JT),RCH(1,JT),1,0)
      IF (X.GT.XBDY(4)) CALL TABPRT (5HVQUCH,VQUCH,12,18)
      IBNDRY=0

C*  START OF ITERATION FOR PRESSURE, WALL TANGENCY CONDITION, OR SLIP LI

  191 IF (SLIP.OR.PCONT(K,JT).OR.ICRNER.EQ.(-9)) YBAR(J,JT)=Y(J,JT)+
     1.5*DX*(VQU(J,JT)+VQUBAR(J,JT))
      RBAR(J,JT)=YBAR(J,JT)*RC+(1.-RC)

      IBDY=0
  192 TS=TT(II,JT)*(PBAR(J,JT)/PT(J,JT))**GAM1QG(JT)

C* CALCULATE AVERAGE VALUE OC COEFFICIENT ALOMG CHARACTERISTICS
      RHOBAR(J,JT)=PBAR(J,JT)/TS
      IF (TS.GT.TT(II,JT)) TS=TT(II,JT)*.99999
      UBAR(J,JT)=SQRT((TT(II,JT)-TS)*GAM2(JT)/(1.+VQUBAR(J,JT)*
     1VQUBAR(J,JT)))
      RHOAVG=(RHOCH(1,JT)+RHOBAR(J,JT))*.5
      UAVG=(UCH(1,JT)+UBAR(J,JT))*.5
      UAVG2=UAVG*UAVG
C*  MAKE Y-PSI CURVE PARABOLIC NEAR AXIS OF SYMMETRY
      IF (YHOLD.EQ.0.) RCH(1,JT)=SQRT(2.*PSI2(1,JT)/(RHOAVG*UAVG))
      RAVG=(RCH(1,JT)+RBAR( J,JT))*.5
      DLGR=SQRT(DX*DX+(RBAR(J,JT)-RCH(1,JT))**2)
      VQUAVG=(VQUCH(1,JT)+VQUBAR(J,JT))*.5

      IF(RAVG.EQ.(0.).AND.X.GT.XBDY(1)) WRITE(6,1723)
      IF (RAVG.EQ.0.) RAVG=.01
 1723 FORMAT (10X,4HRAVG)
      VQRAVG=VQUAVG/RAVG
C*  BYPASS SINGULARITY AT AXIS OF SYMMETRY
      IF (RCH(1,JT).GT.(2.*RBAR(J,JT))) VQRAVG=VQUCH(1,JT)/RCH(1,JT)
      IF (RBAR(J,JT).GT.(2.*RCH(1,JT))) VQRAVG=VQUBAR(J,JT)/RBAR(J,JT)
      GPAVG=(PCH(1,JT)+PBAR(J,JT))*.5*GAMMA(JT)
      ZMAVG2=UAVG2*(1.+VQUAVG*VQUAVG)*RHOAVG/GPAVG
      IF (ZMAVG2.LT.ZMLIM) ZMAVG2=ZMLIM

      TANA=SQRT(1./(ZMAVG2-1.))
```

```
      DPSIC(JT)=DX*RHOAVG*UAVG*RAVG*TANA*((1.+VQUAVG*VQUAVG)/(1.-SGN*
     1VQUAVG*TANA))
C*  SLIP=T  IMPLIES THE BOUNDARY IS A SLIPSTREAM
C*  SLIP=F  IMPLIES THE BOUNDARY IS NOT A SLIPSTREAM
  202 PGUESS=PBAR(J,JT)
      VGUESS=VQUBAR(J,JT)
      IF (PCONT(K,JT)) GO TO 205
C          SOLID WALL BOUNDARY --OR MACH DISC BOUNDARY
C*  USE **LOG P** VARIABLE
      DVQUC=-SGN*UAVG2*RHOAVG*TANA*(VQUBAR(J,JT)-VQUCH(1,JT))
      CSOUND=SQRT(GPAVG/RHOAVG)
      DYC=VQRAVG*RHOAVG*TANA*UAVG*RC
      DR1=-RHS1*(TANA+SGN*VQUAVG)/(UAVG*SQRT(1.+VQUAVG*VQUAVG)*DX)
      DR2=-RHOAVG*UAVG*TANA*RHS2
      DVQUC=(DVQUC+(DYC+DR1+DR2)*CSOUND*DLQR)
      PBAR(J,JT)=PCH(1,JT)*EXP(DVQUC*GAMMA(JT)/GPAVG)

      ERROR=(PGUESS-PBAR(J,JT))/PGUESS
      XJUMP=.2
      IF (X.GT.XBDY(1)) WRITE (6,4024) PBAR(J,JT),PGUESS,ERROR,JT,J
      IF (SLIP) GO TO 280
      CALL PTSLP (PGUESS,ERROR,IBNDRY,VPTSLP,0.)
      IF (PGUESS.LT.PCRIT) GO TO 210
      PGUESS=PCRIT
      IF (PCRIT.EQ.VPTSLP) GO TO 212
      GO TO 210
C          CONSTANT PRESSURE BOUNDARY
  205 PBAR(J,JT)=PBOUND(K,JT)
      CALL MOC (VQUBAR(J,JT),VQUCH(1,JT),PBAR(J,JT),PCH(1,JT),SGN,TANA,
     1RHOAVG,UAVG,VQRAVG,DLQR,IPRESS)
      IF (SOLID(K,JT)) GO TO 2071
      ERROR=VGUESS-VQUBAR(J,JT)
      SLOPE(K,JT)=(VQUBAR(J,JT)+VQU(J,JT))*.5
      XJUMP=-.020
      IF (X.GT.XBDY(3)) WRITE (6,4027) VQUBAR(J,JT),VGUESS,ERROR,JT,J
      CALL PTSLP (VGUESS,ERROR,IBNDRY,VPTSLP,0.)
      IF (PBAR(J,JT).GT.(.8*P(J,JT)).OR.IADJ(K,JT)) GO TO 210
C*
C*  IF EXPANDING TO A NEW PRESSURE WHICK IS SUBSTANTIALLY DIFFERENT, ADJ
C*  THE INITIAL GUESS FOR THE STREAMLINE SLOPE
      IADJ(K,JT)=.TRUE.
      VGUESS=VQUBAR(J,JT)
      IBNDRY=0
      GO TO 210
 2071 CONTINUE
C* BOTH SOLID AND PCONT ARE .TRUE.--MUST CALCUOATE MASS FLOW DECREMENT
C*  SINCE BOTH SOLID AND-PCONT- ARE TRUE, THE FLOW CANT BE PARALLEL TO T
C*  WALL.  TRACE THE OUTER S.L. BACK TO THE PREVIOUS X-STATION, FIND THE
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C*   THERE, AVERAGE WOITH THE CURRENT SLOPE TO FIND *DY*, THE DISTANCE TH
C*   HAS MOVED OUTWARD.  THIS IIVES THE *Y* POSITION OF THAT S.L. AT THE
C*   CURRENT STATION.  COMPARE IT WITH THE DESIRED CURRENT VALUE,*YBAR*,
C*   CHANGE *PSIBDY* ACCORDINGLY.
      CALL LSPFIT (PSI(JJ,JT),VQU(JJ,JT),JJJ,PSIBDY,VQUPRE,1,0)
      CALL LSPFIT (PSI(JJ,JT),  Y(JJ,JT),JJJ,PSIBDY, YPREV,1,0)
      DY=(VQUPRE+VQUBAR(J,JT))*.5*DX
      YCALCU=YPREV+DY
      ERROR=YHOLD-YCALCU
      XJUMP=.1
      CALL PTSLP (PSIBDY,ERROR,IBNDRY,VPTSLP,0.)

  207 IF (.NOT.SLIP) GO TO 210
      IF (X.GT.XBDY(2)) WRITE (6,4025) YBAR(J,JT),VQUBAR(J,JT),J,JT
      IF (JT.EQ.2) GO TO 209
      VQUBAR(1,2)=VQUBAR(J,JT)
      JT=2
      KJT=4
      J=1
      JJ=1
      SGN=-1.0
      K=1
      IF (IBNDRY.NE.0.OR.ICH.NE.0) GO TO 191
      JSHK=0
      KSHOCK=3
      IF (XSHOCK(JT).LE.X) JSHK=JSHOCK
      SLOPE(K,JT)=VQUBAR(1,2)
      GO TO 88
  209 JT=1
      KJT=1
      JJ=JJHOLD
      J=JHOLD
      SGN=1.0
      K=2
      ERROR=(PBAR(J,JT)-PBAR(1,2))/PBAR(J,JT)
      XJUMP=-.15
      IF (X.GT.XBDY(2)) WRITE (6,4026) SLOPE(1,2),ERROR,PBAR(J,JT),
     1PBAR(1,2)
      CALL PTSLP (SLOPE(K,JT),ERROR,IBNDRY,VPTSLP,0.)
      VGUESS=SLOPE(K,JT)

  210 TOL=ABS(ERROR)
      IF (IBNDRY .GT. 10) GO TO 208
      IF (TOL.LT..0001) GO TO 211
      VQUBAR(J,JT)=VGUESS
      PBAR(J,JT)=PGUESS
      GO TO 191

  212 IF(X.GT.XBDY(1)) WRITE(6,4029) J,JT
      PBAR(J,JT)=PCRIT
  208 IF(X.GT.XBDY(1)) WRITE(6,1220) UCH(1,JT),PBAR(J,JT),PGUESS,
     1VQUBAR(J,JT),VGUESS
  211 JT1TOL=1
      KSTOR=1
  213 TOL=ABS((DPSI1(JT)-DPSIC(JT))/DPSI(JT))
      IF (X.GT.XBDY(4)) WRITE (6,4023) DPSIC(JT),DPSI1(JT),TOL,UCH(1,JT)
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      IF (TOL.LT..01) GO TO 220
      IF (ICH.GT.5) GO TO 225
      XJUMP=.5
      CALL PTSLP (DPSI1(JT),DPSIC(JT),ICH,VPSLCH(KSTOR),1.)
      IF (.NOT.SLIP) GO TO 195
      IF (JT.EQ.2) GO TO 219
      ICH=ICH-1
      GO TO 216
  215 IF (JT.EQ.2) GO TO 218
      JT1TOL=0
  216 JT=2
      KSTOR=5
      GO TO 213
  218 IF (JT1TOL.EQ.0) GO TO 292
      ICH=ICH+1
  219 JT=1
      GO TO 195
  220 IF (SLIP) GO TO 215
  225 IF (ICRNER.EQ.(-9)) GO TO 300
  260 RETURN

  280 TOL=ABS(ERROR)
      IF (TOL.LT..0001) GO TO 207
      IF (IBDY.GT.10) GO TO 281
      CALL PTSLP (PGUESS,ERROR,IBDY,VPTSLP(5),0.)
      PBAR(J,JT)=PGUESS
      IF (PGUESS.LT.PCRIT) GO TO 192
      PBAR(J,JT)=PCRIT
      IF (PCRIT.NE.VPTSLP(5)) GO TO 192
      PGUESS=PCRIT
  281 PBAR(J,JT)=PGUESS
      GO TO 207
C*  ENDSURE DUAL STREAMLINE PROPERTIES REMAIN IDENTICAL
  292 JT=1
      YBAR(J,JT)=YBAR(1,2)
      PBAR(J,JT)=PBAR(1,2)
      TS=TT(II,JT)*(PBAR(J,JT)/PT(J,JT))**GAM1OG(JT)
      RHOBAR(J,JT)=PBAR(J,JT)/TS
      UBAR(J,JT)=SQRT((TT(II,JT)-TS)*GAM2(JT)/(1.+VQUBAR(J,JT)*
     1VQUBAR(J,JT)))
      SLOPE(2,1)=VQUBAR(J,JT)
      RETURN

  300 IF (IGO.EQ.1) GO TO 320
      IF (PBAR(J,JT).GT.(.85*P(J,JT))) GO TO 320
      VQUBAR(J,JT)=VQUBAR(J,JT)+.05
      GO TO 180
  320 CALL ONEDIM (JHOLD,JT,T10,IGO,VGUESS,PCRIT)
      IF (IGO.NE.2) GO TO 180
      ICRNER=-5
      RETURN

 1220 FORMAT (1X,30HFAILURE OF BOUNDARY ITERATION   ,/,1X,37HUCH,UGUESS,P
     1BAR,PGUESS,VQUBAR,VGUESS   ,6F15.6)
 4023 FORMAT (1X,19HDPSIC,DPSI1,TOL,UCH,4F15.5)
 4024 FORMAT (1X,12HSOLID WALL--,17HPBAR,PGUESS,ERROR,3F14.7,5H  JT=,I3,
```

```
     14H  J=,I3)
4025 FORMAT (1X,12HSLIPSTREAM--,16HYBAR,VQUBAR,J,JT,2F14.7,2I3)
4026 FORMAT (1X,12HSLIPSTREAM--,21HSLOPE,ERROR,PBAR,PBAR,4F14.7)
4027 FORMAT (1X,19HPRESSURE BOUNDARY--,3F14.7,5H  JT=,I3,4H  J=,I3)
4029 FORMAT (27HFLOW WENT SUBSONIC IN BNDRY,3X,3HJ =,I4,3X,4HJT =,I4)
     END
```

```
*DECK COEFF
      SUBROUTINE COEFF(K)
*COEFF        EVALUATES COEFFICIENTS FOR A GENERAL PARABOLIC PDE
      COMMON /CTHETA/ THETA,II
      COMMON /CTKESH/ RJ,EJ,SQRTEJ,EJI,UJ,ZMU,ZMJET
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PROUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON /CENDS/ JSTART,JEND
      COMMON /CPBOLI/ A(46,1),ALPHA(1,1),BETA(46,1),GAMM(46,1),
     1  DELTA(46,1)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      LOGICAL MIX
      DATA MIX,ZJC,GC,C,ETA,ALFA /.TRUE.,778.,32.174,2.59,.586,.2/
      DATA IENTER /0/
C*  -ZLT-  IS THE MIXING LENGTH
C*  -REYT- IS THE REYNOLDS NUMBER OF TURBLLENCE
C*  -ZMUT- IS THE TURBULENT VISCOSITY
C*  -UJ-  IS THE REFERENCE VELOCITY OF THE JET
C* --RJ-  IS THE RADIUS OF THE JET EXIT
C*  -ZLT-  IS THEH MIXING LENGTH NON-DIMENSIONALIXED BY THE INITIAL REDI
C(   JET
      IF (IENTER.EQ.0) GO TO 500

   20 ZLT=ZMIXL(X)
      JADJUS=0
      IF (JT.EQ.2) JADJUS=NJJ(1)
      DO 100 JJ=JSTART,JEND
      J=JJ-JADJUS

C*     **************         ***********
C*  TURBULENCE MODEL
C*     **************
      RUY=RHO(J,JT)*U(J,JT)*R(J,JT)*R(J,JT)
      SQRTE=SQRT(A(JJ,K))
      REYT=RHO(J,JT)*ZLT*SQRTE*SQRTEJ/(ZMU*UJ)

      IF (MIX) GO TO 55
C*  IN THE JET MIIING PROBLEM, -H- IS ALWAYS UNITY
      ZLAMDA=REYT*REYOI
      IF (ZLAMDA.GT.1.25) GO TO 55
      IF (ZLAMDA.GT. .75) GO TO 54
      H=ZLAMDA
      GO TO 56
   54 H=ZLAMDA-(ZLAMDA-.75)**2
   56 ZMUHA=ZMU*H*ALFA
      ALFETH=ALFA*ETA*H
   55 ZMUT=ZMUHA*REYT
      D=1.+ALFETH*REYT
      DUQDSY=0.
      IF (Y(JLBDY,JT).LT..0001 .AND.JJ.EQ.JSTART) GO TO 72
```

```
C*  AXIS OF SUMMETRY POINT
C*  SYMMETRY FORCES DUQDSY TO TE ZERO ON AXIS
      JP1=J+1
      IF (JP1.GT.NJJ(JT)) JP1=NJJ(JT)
      JM1=J-1
      IF (JM1.LT.JLBDY) JM1=JLBDY
C*  AT OUTER EDGE OF JET, USE ONE-SIDED DERIVATIVE (IT SHOUL D BE SMALL)
      DUQDSY=(U(JP1,JT)-U(JM1,JT))/(PSI(JP1,JT)-PSI(JM1,JT))
      DUQDSY=DUQDSY*DUQDSY
   72 CONTINUE

C*  CALCULATE OOEFFICIENTS OF THE PARABOLIC PDE
      BETA(JJ,K)=ZMU*D*RUY
      GAMM(JJ,K)=RUY*DUQDSY*ZMUT*EJI*UJ*UJ
      DELTA(JJ,K)=-ZMU*D*C/(RHO(J,JT)*U(J,JT)*ZLT*ZLT)

  100 CONTINUE
      RETURN
C*  CONSTANTS
  500 IENTER=1
      ZMJ=ZMN(1,1)
      REYOI=1./110.
      EJI=1./EJ
      SQRTEJ=SQRT(EJ)
      II=1
C*  ZMU=ZMUINF/(RHOINF*UJ*RJ)=ZNUINF/(UJ*RJ)
      ZMUINF=1.6E-4
      ZMU=ZMUINF*RHO(1,1)/(RJ*UJ)
      H=1.
      ZMUHA=ZMU*H*ALFA
      ALFETH=ALFA*ETA*H
      ALPHA(II,K)=1.
      GO TO 20
      END
```

```
*DECK CORNER
      SUBROUTINE CORNER(X,Y,PCONT,XL,J,P,PBOUND)
*CORNER       LOOKS FOR CORNERS IN BOUNDARIES --CORNER
      COMMON /CCRNER/ NPTSM1,K,ICRNER,XCRNER
      COMMON /CSTOR2/ DX1,SGN,I1,IEND(2,2)
      COMMON /CBNDRY/ CBDUM(652),JT,CBDUMM(10)
      COMMON /CSHK/ TANS1,DSHOCK,PSISHK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CBITS/ BITS,BLANK
      COMMON/QSHKPT/SHKPRT
      DIMENSION X(23),Y(23),XS(2),YS(2),P(23)
      LOGICAL PCONT,DSHOCK,SHKPRT

C*  ICRNER=1  IMPLIES EXPANSION FAN TO SOLID WALL (OR PRESSURE BNDRY)
C*  ICRNER=0  IMPLIES LOOK FO  A CORNER
C*  ICRNER=-1 IMPLIES START SHOCK TO A SOLID WALL
C*  ICRNER=-2 IMPLIES -SEARCH- HAS DETECTED A COALESCING SHOCK

      NJ=J
      IF (XL.EQ.BITS) XK=BITS
      NPT=NPTSM1+1

      IF (PCONT) GO TO 169
  170 DO 171 I=I1,NPTSM1
      IF (X(I).EQ.X(I+1)) GO TO 172
  171 CONTINUE
      IF (SHKPRT) WRITE (6,1) X(I)
      IEND(K,JT)=1
  169 CONTINUE
      IF (XK.NE.BITS) GO TO 173

C*        IF XL IS NOT INPUT, SET XL EQUAL TO THE SHORTER OF THE UPPER AN
C*        LOWER BOUNDARIES.

      IF (XL.EQ.BITS) XL=X(NPT)
      IF (XL.GT.X(NPT)) XL=X(NPT)
  173 XCRNER=XL
      ICRNER=2
      GO TO 175
C*  A DOUBLE POINT HAS BEEN FOUND
  172 XS(1)=.999*X(I)
      XS(2)=1.001*X(I)
      IF (X(I).NE.0.) GO TO 1725
      XS(1)=-.001
      XS(1)=-.01
      XS(2)=+.001
      XS(2:=.01
 1725 CONTINUE
      CALL LSPFIT (X,Y,NPT,XS,YS,2,0)
      I1=I+1
      DYA=Y(I)-YS(1)
      DXA=X(I)-XS(1)
      PHI1=DYA/DXA
      DYA=YS(2)-Y(I)
      DXA=XS(2)-X(I)
      DANG=DYA/DXA-PHI1
```

```
      IF (.NOT.SHKPRT) GO TO 1722
      WRITE (6,1) XS(1),XS(2),YS(1)
      WRITE (6,1) DANG,PHI1,YS(2)
 1722 CONTINUE
      IF ((-DANG).LT..01) GO TO 174

C*        SHARP CORNER--SHOCK

 1723 XCRNER=X(I)
      IF (SHKPRT) WRITE(6,1) XCRNER
      IF (XSHOCK(JT).EQ.(1.E8)) XSHOCK(JT)=XCRNER
      DSHOCK=.TRUE.
      ICRNER=-1
      GO TO 175

  174 IF (DANG.LT..01) GO TO 170

C*        CORNER WAS NOT SUFFICIENTLY SHARP TO WARRANT A DISCONTINUITY

C*        SHARP CORNER--EXPANSION
      IF (SHKPRT) WRITE (6,1) XCRNER
      ICRNER= 1
      XCRNER=X(I)
  175 CONTINUE
      IF (.NOT.PCONT) GO TO 181
  176 PJ=1.02*P(J)
      IF (PBOUND.GT.PJ) GO TO 190
  181 RETURN
C*
C*   FLOW STARTS WITH A SHOCK TO A CONSTANT PRESSURE BOUNDARY
  190 GO TO (201,200,201,200),K
  200 DSHOCK=.TRUE.
      GO TO 202
  201 DSHOCK=.FALSE.
  202 ICRNER=-3
      RETURN
    1 FORMAT (1X,3F15.6)
      END
```

```
*DECK CNSERV
      SUBROUTINE CNSERV
*CNSERV
      RETURN
      END
```

```
*DECK DXQM1
      SUBROUTINE DXQM1(P,U,RHO,VQU,R,XQSYZM)
*DXQM1        --DXQM1--  CALCUALTES DX/(MX**5-1) NEAR MX=1.0

      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CBNDRY/ CHDUM(460),XBDUMM(186),CDDM(6),JT,RC,DXQDSY,DD(8)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1 ,DX3,TS,DPSI(2)
      COMMON/QSHKPT/SHKPRT
      LOGICAL SHKPRT

      ZLIMCK=.05
      RHOUU=RHO*U*U
      VQUP1=VQU*VQU+1.

C*  ENSURE ZXIAL COMPONENTS OF MN IS SUPERSONIC
      ZMX2M1=RHOUU/(GAMMA(JT)*P)-1.
      XQSYZM=DXQDSY/ZMX2M1
      IF (ZMX2M1.GT.ZLIMCK) GO TO 100

C*  ENDURE PROPER BEHARIOR O NEAR SINGULARITY WHERE
C*  X-COMPONENT OF MACH NUMBER APPROACHES UNITY
      IF (ZMX2M1.LT.0.) ZMX2M1=0.

C*  ENFORCE LIMIT VALUE MORE RAPODLY
      FRACT=ZMX2M1/ZLIMCK
      FRACT=FRACT*FRACT*FRACT

C*  PATCH SOLUTION SMOOTHLY TO ANALYTIC TIMIT AT SINGULARITY
      RLIMIT=-.5*VQU*STABIL/(RHOUU*R*VGUP1)
      XQSYZM=XQSYZM*FRACT+RLIMIT*(1.-FRACT)
      IF(SHKPRT) WRITE(6,1) FRACT,XQSYZM,ZMX2M1,RLIMIT
    1 FORMAT (1X,5HDXQM1,5F15.6)

  100 RETURN
      END
```

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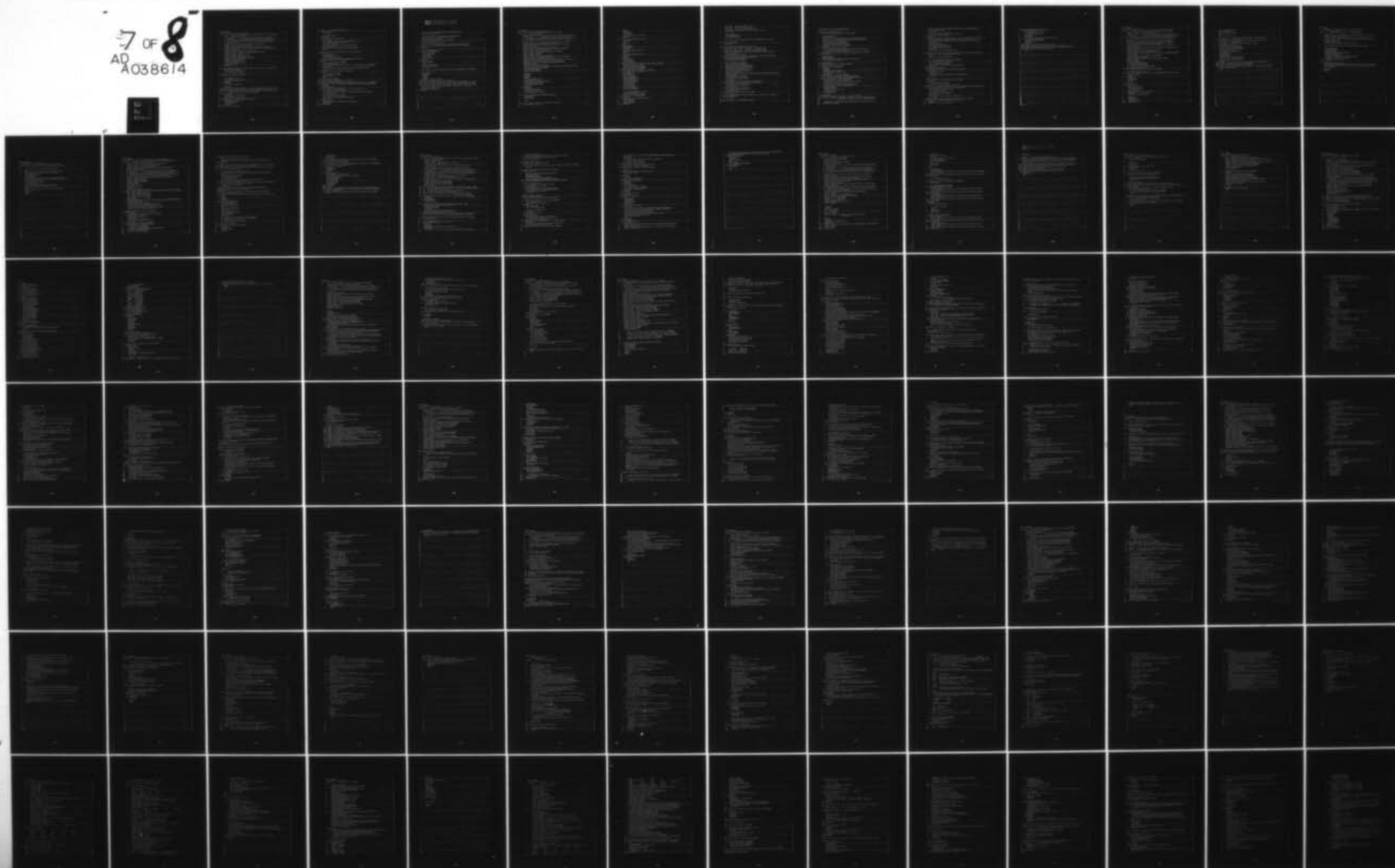


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*DECK ENTROP
      SUBROUTINE ENTROP(ISTEP,JLOC)
*ENTROP       CALCULATES PARAMETERS WHEN ENTROPY VARIES ALONG STREAMLINE
      COMMON /CBITS/ BITS,BLANK
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TTSAVE(1,2)
      COMMON /CENTRO/ PTOT(20,46),XPT(20),NPT,DUM45(45)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,OPSI(2)
      COMMON /CINPUT/ PTINP(40,2),DUMINP(648)
      COMMON /CLOGIC/ PCONT(2,2),DUAL,DDDD(5),SOLID(2,2)
      COMMON /CPTSLP/ XJUMP
      COMMON /CNTROP/ RHS2  ,RHS,RHS1
      COMMON /CPRENT/ XIPRT(2)
      COMMON /COLDPT/ OLDPT(23,2),OLDPTS(2)
      COMMON /CSHKPT/ SHKPT(23,2)
      LOGICAL DUAL,PCONT,SOLID
      DIMENSION VPTSLP(4)
      DATA PTOLD,IFIRST/1.E+15,0/
      DATA DXPTL/0.0/
      J=JLOC

C*   TOTLA PREDSURE **PTOT** HAS BEEE INPUT AT **NXC** X-STATIONS AND ON
C*   **NPSIPT** STREAMLINES
      IF (IFIRST.GT.0) GO TO 5
      IF (IFIRST.LT.0) GO TO 6

C* FIRST TIME THROUGH COUNT NXC

      DO 2 J=1,21
      IF( J.EQ.21) GO TO 2
      IF( XPT(J).EQ.BITS ) GO TO 3
    2 CONTINUE
    3 NXC=J-1
      IF (NXC.LT.2) GO TO 6

    5 IFIRST=1
C* -J-  IS THE STREAMLINE NUMBER.  IT ASSUMES THERE ARE THE SAME NUMBER
C* S.L."S IN THE TOTAL PRESSURE TABLE AS IN THE SSFD CALCULATION
C* -NXC-  IS THE NUMBER OF POINTS PER STREAMLINE IN THE TOTAL PRESSURE T
C*          (ASSUMED THE DAME FOR ALL STREAMLIMES)
   90 JADJUS=0
      IF (JT.EQ.2) JADJUS=NJJ(1)
      JJ=J+JADJUS
      GO TO (120,110,130),ISTEP
C* ISTEP EQUALS TWO1--USE THE BAR QUANTITIES
  110 U2=UBAR(J,JT)*UBAR(J,JT)
      RH=RHOBAR(J,JT)
      PS=PBAR(J,JT)
      GO TO 20
  120 U2=U(J,JT)*U(J,JT)
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C*  STEP 1   USE UNBARRED QUANTITIES
      RH=RHO(J,JT)
      PS=P(J,JT)

      PTOLD=OLDPT(J,JT)
   20 CONTINUE
      PT=PTINP(J,JT)-SHKPT(J,JT)
      XBAR=X-DX*.5
      CALL LSPFIT (XPT,PTOT(1,JJ),NXC,XBAR,DELPT,1,1)
      RHS2=GAM1(JT)*DELPT/(GAMMA(JT)*PT)
      RHS1=DELPT*DX*PS/PT
      RHS=RHS1*(1.+GAM1(JT)*U2*RH/(GAMMA(JT)*PS))
      IF (X.GT.XIPRT(1))
     1WRITE (6,100) PT,PTOLD,DELPT,RHS1,RHS,RHS2
      RETURN

C*  ISTEP=3,  EET UP TOTAL PRESSURES AT NEW X-LOCATION
  130 NJ=NJJ(JT)
      DO 135 J=JLBDY,NJ
      JJ=J+JADJUS
      OLDPT(J,JT)=PTINP(J,JT)
      CALL LSPFIT (XPT,PTOT(1,JJ),NXC,X,PTINP(J,JT),1,0)
  135 PTINP(J,JT)=PTINP(J,JT)-SHKPT(J,JT)
  139 K=2
      IF (.NOT.PCONT(K,JT)) RETURN
      EXPON=1./GAM1QG(JT)
C*  CHECK TO MAKE SURE THAT MACH NUMBER AT OUTER BOUNDARY IS SUPERSONIC
      ZMCRIT=1.1
      PTCRIT=PBOUND(K,JT)*(1.+GAM1(JT)*.5*ZMCRIT*ZMCRIT)**EXPON
      J=NJ
  140 IF (PTINP(J,JT).GT.PTCRIT) GO TO 150
      J=J-1
      IF (J.GT.0) GO TO 140
      IF (JT.EQ.2) GO TO 190
      WRITE (6,101)
      STOP
  150 IF (J.EQ.NJ) RETURN
C*  ENTIRE MASS FLOW REMAINS
C*  MASS FLOW HAS CHANGED, FIND NEW PSIBDY
C*  DO CROSS STREAM INTERPOLATION TO FIND WHERE FLOW IS STILL SUFFICIENT
C*  SUPERSONIC.  BUT WE MUST ITERATE BECAUSE PTINP MAY BE NON-MONOTONII
  160 KOUNT=0
      PSIG=PSI(J,JT)
      XJUMP=PSI(J+1,JT)-PSI(J,JT)
  165 CALL LSPFIT (PSI(1,JT),PTINP(1,JT),NJ,PSIG,PTCALC,1,0)
      DELPT=(PTCALC-PTCRIT)/PTCRIT
      IF(X.GT.XIPRT) WRITE(6,105) PTCRIT,DELPT,PTCALC,XJUMP,XIPRT,X
      ERROR=ABS(DELPT)
      IF (KOUNT.GT.10) GO TO 170
      IF (ERROR.LT..001) GO TO 180
      CALL PTSLP (PSIG,DELPT,KOUNT,VPTSLP,0.)
      GO TO 165
  170 WRITE (6,103)
      PSIG=PSI(J,JT)+.01*(PSI(J+1,JT)-PSI(J,JT))
      XIPRT(1)=X
  180 SYFRCT=.25
```

```
      IF (J.GT.1) SYFRC1=SYFRCT*(PSI(J,JT)-PSI(J-1,JT))
      SYCHEK=SYFRC1+PSI(J,JT)

      CHANGE=(PSIG-PSI(J,JT))/(PSI(J+1,JT)-PSI(J,JT))
      DYSQRD=Y(J+1,JT)*Y(J+1,JT)-Y(J,JT)*Y(J,JT)
      DYSQRD=(1.-CHANGE)*DYSQRD
      YCALCL=SQRT(Y(J+1,JT)*Y(J+1,JT)-DYSQRD)
      DYLOSS=Y(J+1,JT)-YCALCL
      IF (X.LT.XIPRT(2)) GO TO 181
      WRITE (6,104) NJJ(JT),JT,PSIG,X,DX,PSI(J,JT),PSI(J-1,JT)
      WRITE (6,105) CHANGE,DYSQRD,DYLOSS,Y(J+1,JT),Y(J,JT),YCALCL
  181 CONTINUE

      IF (PSIG.LT.SYCHEK) J=J-1
      PTINP(J+1,JT)=PTCRIT
      PSI(J+1,JT)=PSIG
      Y(J+1,JT)=YCALCL
      NJJM1(JT)=J
      NJJ(JT)=J+1
      NJJM2(JT)=J-1
      RETURN
  190 DUAL=.FALSE.
      WRITE (6,102)
      JT=1
       PCONT(K,JT)=.TRUE.
      SOLID(K,JT)=.FALSE.
      GO TO 130

C*   TOTOL PRESSURE ALONF STREAMLINE WAS NOT INPUT--ASSUME IU IS CONSTANT

    6 IFIRST=-1
      EXPOFS=1.
      RHS1=0.
      RHS=0.
      RETURN
  100 FORMAT (6F18.6,6HENTROP)
  101 FORMAT (1X,23HENTIRE FLOW IS SUBSONIC)
  102 FORMAT (1X,40HONLY THE INNER STREAM REMAINS SUPERSONIC)
  103 FORMAT (1X,50HITERATION FOR CRITIACL MACH NUMBER FAILED--ENTROPY)
  104 FORMAT (1X,45HA PORTION OF THE OUTER FLOW HAS GONE SUBSONIC,/,28HN
     1EW OUTER BOUNDARY IS AT NJ=,I5,3HJT=,I5,8HPSI8DY =,F12.6,5H    X,
     2F12.6,6H    DX=,3F12.6)
  105 FORMAT (1X,6F12.6)
      END
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```
*DECK FRONT
      SUBROUTINE FRONT(P1,U1,RHO1,VQU1)
*FRONT         CALCULATES PROPERTIES IN FRONT OF A SHOCK
      COMMON /CCHARL/ YCHARL
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),           R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4          ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5  ,TT(1,2)
      COMMON /CSHOCK/ PS(5,2),US(5,2),RHOS(5,2),VQUS(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CSHK/ TANS1,DSHOCK,PSHOCK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CFRONT/ ISHOCK,YSHV,PSISHK,FRACTN
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),DUMMY(9)
      COMMON /CXPR/ XX(3),XXX
      COMMON /CPTSLP/ XJUMP
      COMMON /CINPUT/ PT(40,2),DUMINP(648)
      COMMON /CMOC/ ITER,P1SAVE,U1SAVE,RHO1SA,VQU1SA,Y1SAVE,JSET
      COMMON /COLDPT/ OLDPT(23,2),OLDPTS(2)
      DIMENSION TANA(2),VQUAV(2),RHOUU(2),GPAV(2),UAV(2),VPTSLP(12)
      DIMENSION PCH(2),UCH(2),RHOCH(2),VQUCH(2),YCH(2)
      DIMENSION PC(3),UC(3),RHOC(3),VQUC(3),YC(3),PTC(3)
      DIMENSION PSIC(3)
      DIMENSION C(2),D(2),E(2),DL(2)
      COMMON /CSHENT/ RHS1HL(4),RHS2HL(4),SYHOLD(4),YENTHL(4),JSTJ,JJJJ
     1  ,YENCH(2),RHS1EN(2),RHS2EN(2)
      COMMON/QSHKPT/SHKPRT
      LOGICAL DSHOCK,SHKPRT

      IPSISH=0
      ISET=0
      IOUTER=0
      IOUT=0
      IF (ITER.NE.99) GO TO 10
      VQUPRE=VQU(JSET,JT)
      YSHK=Y1SAVE+(VQU1+VQUPRE)*.5*DX
      YCH(1)=YCH(1)+YSHK-YSHV
      YCH(2)=YCH(2)+YSHK-YSHV
      GO TO 45
   10 YSHK=YSHV
      TOL=1.E-4
      EXPON=1./GAM1QG(JT)
      TSQTTC=2./(GAMMA(JT)+1.)
      IF (ISHOCK.GT.0) GO TO 45

C*  INITIALISE PROPERTIES ON CHARACTERISTICS
      YCH(1)=YSHK
      YCH(2)=YSHK

      NP=3

C*  SET UP INTERPOLATION VECTOR FROM LAST  X-STEP
      IF (DSHOCK) GO TO 20
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      L=4
      SIGN=1.
      JS=JSHOCK+1
      JR=JSHOCK+2
      IF (JR.LE.NJJ(JT)) GO TO 30
      JR=NJJ(JT)
      NP=2
      IF (JS.LE.NJJ(JT)) GO TO 30
      JS=NJJ(JT)
      NP=1
      GO TO 30
   20 L=3
      JS=JSHOCK-1
      JR=JSHOCK-2
      SIGN=-1.
      IF (JR.GE.JLBDY) GO TO 30
      JR=JLBDY
      NP=2
      IF (JS.GE.JLBDY) GO TO 30
      JS=JLBDY
      NP=1
   30 CONTINUE
      YC(1)=YSHOCK
      YC(2)=Y(JS,JT)
      YC(3)=Y(JR,JT)
C*  CHECK TO BE DURE THAT **Y"S** APRE PROPERLY ORDERED
      DYCHEK=(YC(2)-YC(1))*SIGN
      IF (DYCHEK.GT.0.) GO TO 31
      YC(2)=YC(1)+SIGN*.001*YCHARL
   31 DYCHEK=(YC(NP)-YSHK)*SIGN
C*  MAKE SURE **YSHK** IS INDIDE **YC**TABLE
      IF (DYCHEK.GT.0.) GO TO 32
      YSHK=YC(NP)
   32 PC(1)=PS(L,JT)
      UC(1)=US(L,JT)
      VQUC(1)=VQUS(L,JT)
      PSIC(1)=PSHOCK
      PSIC(2)=PSI(JS,JT)
      PSIC(3)=PSI(JR,JT)
      PC(2)=P(JS,JT)
      PC(3)=P(JR,JT)
      UC(2)=U(JS,JT)
      UC(3)=U(JR,JT)
      VQUC(2)=VQU(JS,JT)
      VQUC(3)=VQU(JR,JT)

      IF (XXX.GT.DUMMY(2)) GO TO 1111
      IF (.NOT.SHKPRT) GO TO 321
      CALL TABPRT (2HPS,PS,50,10)
      WRITE (6,1) L,JT,OLDPTS,NP
  321 CONTINUE
    1 FORMAT (1X,4HL,JT,2I8,2F16.6,I8)
      PC(1)=PS(4,2)
      UC(1)=US(4,2)
      VQUC =VQUS(4,2)
 1111 CONTINUE
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```
      CALL LFIT    (YC,PC,NP,YSHK,P1,1,0)
      CALL LFIT    (YC,UC,NP,YSHK,U1,1,0)
      CALL LFIT    (YC,VQUC,NP,YSHK,VQU1,1,0)
      TS=TT(1,JT)-GAM1QG(JT)*U1*U1*(1.+VQU1*VQU1 )*.5
      RHO1=P1/TS

      PTC(1)=OLDPTS
      PTC(2)=OLDPT(JS,JT)
      PTC(3)=OLDPT(JR,JT)

      IF (XXX.LT.DUMMY(2).AND.SHKPRT) CALL TABPRT(3HPC ,PC,18,9)

   45 DO 150 JINT=1,2
      IFRONT=0

C*   USE LINEAR INTERPO9ATIOM--NOT QUADPATIC
   50 CALL LFIT (YC,  PC,NP  ,YCH(JINT),  PCH(JINT),1,0)
      CALL LFIT (YC,  UC,NP  ,YCH(JINT),  UCH(JINT),1,0)
   60 CALL LFIT (YC,VQUC,NP  ,YCH(JINT),VQUCH(JINT),1,0)
      TS=TT(1,JT)-GAM1QG(JT)*UCH(JINT)*UCH(JINT)*(1.+VQUCH(JINT)*
     1VQUCH(JINT))*.5
      RHOCH(JINT)=PCH(JINT)/TS
C*    CALCULATE AVERABE PROPERTIES ALONG EACH OF TWO CHARACTERISTICS
   70 GPAV(JINT)=GAMMA(JT)*(PCH(JINT)+P1)*.5
      UAV(JINT)=(UCH(JINT)+U1)*.5
      UAV2=UAV(JINT)*UAV(JINT)

C*   **C** IS THE SPEED OF SOUND
      RHOAV=(RHOCH(JINT)+RHO1)*.5
      VQUAV(JINT)=(VQUCH(JINT)+VQU1)*.5
      VQU2P1=1.+VQUAV(JINT)*VQUAV(JINT)
      ZMAV2=RHOAV*UAV2*VQU2P1/GPAV(JINT)
      TANA(JINT)=1./SQRT(ZMAV2-1.)
      RHOUU(JINT)=RHOAV*UAV2*TANA(JINT)
      SG=3.-2.*FLOAT(JINT)
      DYCH=DX*(VQUAV(JINT)+SG*TANA(JINT))/(1.-SG*VQUAV(JINT)*TANA(JINT))
      YCHC=YSHK-DYCH
      ERROR=ABS(YCH(JINT)-YCHC)
      IF (ERROR.LT.TOL) GO TO 145
      IF (IFRONT.GT.10) GO TO 143
      XJUMP=3.*DX
      CALL PTSLP (YCH(JINT),YCHC,IFRONT,VPTSLP(1),1.)
C*   MAKE SURE UOU DONT EXTRAPOLATE IN -YCH- TABLE
      DYCHEK=(YCH(JINT)-YC(1))*SIGN
      IF (DYCHEK.GT.0.) GO TO 80
      YCH(JINT)=YC(1)
   80 DYCHEK=(YC(NP)-YCH(JINT))*SIGN
      IF (DYCHEK.GT.0.) GO TO 85
      YCH(JINT)=YC(NP)
   85 IF (YCH(JINT).EQ.VPTSLP) GO TO 1499
      GO TO 50
C*   SET YCH IDEBNTICALLY EQUAL TO DYCH VALUE TO KEEP OUT OF TROUBLE IN 8
  145 YCH(JINT)=YCHC
      GO TO 143

 1499 IF (SHKPRT) WRITE(6,1498) YCH,JINT
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 1498 FORMAT (1X,2F14.7,I8,8HYCH,JINT)

C*  CALCULATE VISCOUS EFFECTE
  143 DL(JINT)=SQRT(DX*DX+(YSHK-YCH(JINT))**2)

      YENCH(1)=YCH(JINT)
      YENCH(2)=YSHK
      CALL LFIT (YENTHL,RHS1HL(JSTJ),JJJJ,YENCH,RHS1EN,2,0)
      CALL LFIT (YENTHL,RHS2HL(JSTJ),JJJJ,YENCH,RHS2EN,2,0)
      RHS2=(RHS2EN(1) +RHS2EN(2))*.5
      RHS1=(RHS1EN(1) +RHS1EN(2))*.5
      IF (XX(3).GT.DUMMY(2)) GO TO 144
      IF(SHKPRT) WRITE(6,1426) RHS1,RHS2
  144 CONTINUE
      C(JINT)=SQRT(GPAV(JINT)/RHOAV)
      E(JINT)=C(JINT)*(TANA(JINT)+SG*VQUAV(JINT))/(UAV(JINT)*
     1      VQU2P1 *DX)*DL(JINT)*RHS1
      D(JINT)=RHOAV*UAV(JINT)*TANA(JINT)*RHS2*DL(JINT) *C(JINT)
  150 CONTINUE

      B1=E(1)+D(1)
      B2=E(2)+D(2)
C*  FORCE AXISYMMETRIC TERM TO VANISH IF -YSHK=-0.-
      IF (RC.EQ.0.) GO TO 100

C*  AXISYMMETRIC
C*  BYPASS SINGULARITY AT AXIS OF SYMMETRY
      IF (YSHK.GT.0.) GO TO 160
C*  ENSURE -YHHK- IS POSIYIVE
      YSHK=0.
      IPSISH=1
      PSISHK=PSI(1,JT)-.0001
      IF (YCH(2).LE.0.) GO TO 100
      GO TO 165
  160 VQRAVG=VQUAV( 2)/(YSHK+YCH(2))*2.
      IF (YSHK.GT.(2.*YCH(2))) VQRAVG=VQU1/YSHK
  165 IF (YCH(2).GT.(2.*YSHK)) VQRAVG=VQUCH(2)/YCH(2)
      B2=C(2)*RHOUU(2)/UAV(2)*VQRAVG*DL(2)
      VQRAVG=VQUAV( 1)/(YSHK+YCH(1))*2.
      IF (YCH(1).GT.(2.*YSHK)) VQRAVG=VQUCH(1)/YCH(1)
      VQU1=2.*VQUAV( 1)-VQUCH(1)
      IF (YSHK.GT.(2.*YCH(1))) VQRAVG=VQU1/YSHK
      B1=C(1)*RHOUU(1)/UAV(1)*VQRAVG*DL(1)
      B1=B1+E(1)+D(1)
      B2=B2+E(2)+D(2)
      IF (YSHK.GT..08) GO TO 100
      B1=B1*YSHK*12.5
      B2=B2*YSHK*12.5

  100 CONTINUE
C*  CALCULATE PREPERTIES AT SHOCK BY CHARACTERISTICS
C*  FOR -CH- VARIAVLES, SUBSCRIPT 1 REFERS TO THETA+MU CHARACTERISTIC
C*                      SUBSCRIPT 2 REFERS TO THETA-MU CHARACTERISTIC

      VQU8=(RHOUU(1)*VQUCH(1)+RHOUU(2)*VQUCH(2)-B1+B2+PCH(1)-PCH(2))/
     1(RHOUU(1)+RHOUU(2))
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      IF(XXX.LT.DUMMY(2).AND.SHKPRT) WRITE(6,1001) P1,P8,VQU1,VQU8
      ERROR=ABS(VQU8-VQU1)
      XJUMP=-.020
      IF (ERROR.LT.TOL) GO TO 180
      CALL PTSLP (VQU1,VQU8,IOUT,VPTSLP( 5),1.)
      IF (IOUT.LT.10) GO TO 45
  180 IOUT=0
      P8=(RHOUU(2)*PCH(1)+RHOUU(1)*PCH(2)   +RHOUU(2)*RHOUU(1)*(VQUCH( 1)
     1-VQUCH(2))-RHOUU(1)*B2-RHOUU(2)*B1)/(RHOUU(1)+RHOUU(2))
      IF(XXX.LT.DUMMY(2).AND.SHKPRT) WRITE(6,1001) P1,P8,VQU1,VQU8,U1,
     1 RHO1,YSHK
      ERROR=ABS(P8-P1)
      YPRE=(YCH(1)+YCH(2))*.5
      IF (ERROR.LT.TOL) GO TO 300
      IF (IOUTER.GT.11) GO TO 200
      XJUMP=.05
      CALL PTSLP (P1,P8,IOUTER,VPTSLP(9),1.)

C*  ASSUME STREAMLINE AT PREVIOUS X-STATION IS JALF WAY BETWEEN THE 2 CH
      CALL LFIT   (YC,PTC,NP,YPRE,PTPRE,1,0)
      II=1
      TSQTT=(P1/PTPRE)**GAM1QG(JT)

C*  CHECK TO BE SURE MACH NUMBER IS SUPERSONIC
      IF (TSQTT.LT.TSQTTC) GO TO 181
      IF (.NOT.SHKPRT) GO TO 1801
      CALL TABPRT (2HPC,PC,18,6)
      WRITE (6,182) YPRE,PTPRE,P1,TSQTT,TSQTTC,NP
 1801 CONTINUE
      TSQTT=TSQTTC*.99999
  182 FORMAT (1X,19HYPRE,PTPRE,P1,TSQTT,5F15.6,I6)
  181 CONTINUE
      TS=TT(II,JT)*TSQTT
      RHO1=P1/TS
      U1=SQRT((TT(II,JT)-TS)*GAM2(JT)/(1.+VQU1*VQU1))
      GO TO 45

  200 CONTINUE
      IF (SHKPRT) WRITE(6,1000) P1,U1,RHO1,VQU1
  300 IOUT=0
      IF (ITER.EQ.99) GO TO 400
      IF (IPSISH.EQ.1) RETURN
  330 CALL LFIT (YC,VQUC,NP,YPRE,VQUPRE,1,0)
C*  TRACE SHOCK STREAMLINE BAXK TO PREVIOUS X-STATION AND INTERPOLATE TH
C*  GET -PSI- VALUE AT SHOCK AT CURRENT X-STATION
      YPREC=YSHV-(VQU1+VQUPRE)*.5*DX
      ERROR=ABS(YPREC-YPRE)
      IF (ERROR.LT..0005) GO TO 340
      IF (IOUT.GT.10) GO TO 339
      XJUMP=-.020
      CALL PTSLP (YPRE,YPREC,IOUT,VPTSLP(5),1.)
      GO TO 330
  339 IF (SHKPRT) WRITE(6,1002) YPRE,YPREC,ERROR,VQU1,VQUPRE
  340 CALL LFIT (YC,PSIC,NP,YPRE,PSISHK,1,0)
      RETURN
C*  GIVEN PSI VALUE, FIND CORRECT Y
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 400 YNEW=YPRE+(VQU1+VQUPRE)*.5*DX
     ERROR=YNEW-YSHK
     IF (ERROR.LT..001) RETURN
     IF (ISET.GT.10) RETURN
     XJUMP=-.020
     YSHO=YSHK
     CALL PTSLP (YSHK,YNEW,ISET,VPTSLP(5),1.)
     YCH(1)=YCH(1)+YSHK-YSHO
     YCH(2)=YCH(2)+YSHK-YSHO
     IOUTER=0
     GO TO 45
1000 FORMAT (1X,15HP1,U1,RHO1,VQU1,4F16.6)
1001 FORMAT (1X,23HP1,P8,VQU1,VQU8,U1,RHO1,5H YSHK,7F14.7)
1002 FORMAT (1X,5F14.7,38HYPRE,YPREC,ERROR,VQU1,VQUPRE,$$FRONT**)
1426 FORMAT (10X,13HFRONT--ENTROP,2F16.6)
     END
```

```
*DECK MDISC
      SUBROUTINE MDISC
*MDISC        -MDISC-  CONYROL ROUTINE FOR CALCULATING MACH DISCS
      COMMON /CNSHK/ RHON(2),PN(2),UN(2),VQUN(2),WQUN(2),ZN(3)
      COMMON /CINPUT/ PTOT(40,2),DUMINP(648)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),           R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CSHK/ TANS1,DSHOCK,PSISHK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CCRNER/ NPTSM1,KDUM,ICRNER,XCRNER
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,ENDJOB
     1  ,SOLID(2,2)
      COMMON /CXDISC/ XMDISC,XSAVE, IDISC,MDISCC
      COMMON /CBITS/ BITS,BLANK
      LOGICAL AXISYM,DUAL,SSTRM,PCONT,BARPRT,ENDJOB,SOLID
      LOGICAL DSHOCK
      LOGICAL MDISCC
      IF (IDISC.EQ.2) RETURN
      IF (XMDISC.EQ.BITS) RETURN
      IF (IDISC.EQ.(-1)) RETURN
      IF (XCRNER.GT.XMDISC) XCRNER=XMDISC
      IF (X.LT.XMDISC) RETURN
C*  HAVE PASSED CRITERIA FOR STARTING A MACH DISC

      IF (IDISC.EQ.1) GO TO 100
C*  DONT INSERT MACH DISC UNTIL DATA ALLOWING RESTART HAS BEEN STORED
      WRITE (6,1003) X
      XL=1.E8
      IDISC=-1
      XCRNER=1.E8
      XMDISC=1.E8
      RETURN

  100 XMDISC=1.E8
      L=1
      PN(1)=P1(L,JT)
      RHON(1)=RHO1(L,JT)
      VQUN(1)=VQU1(L,JT)
      UN(1)=U1(L,JT)
      ZN(2)=SQRT(1./(1.+TANS1*TANS1))
      ZN(2)=0.
      ZN(1)=SQRT(1.-ZN(2)*ZN(2))

      ICRNER=-4
      MDISCC=.TRUE.
      JLBDY=JLOW
      JLBDY1=JLBDY+1
```

```
      WRITE (6,1000) JLBDY
      WRITE (6,1001)
      CALL NORMSH (GAMMA(JT))
      K=1
      PBOUND(K,JT)=PN(2)

      ZM1=U1(L,JT)*     (RHO1(L,JT)/(GAMMA(JT)*P1(L,JT)))*U1(L,JT)
     1 *(1.+VQU1(L,JT)*VQU1(L,JT))
      ZM2=U2(L,JT)*     (RHO2(L,JT)/(GAMMA(JT)*P2(L,JT)))*U2(L,JT)
     1 *(1.+VQU2(L,JT)*VQU2(L,JT))
      ZM4=UN(2)*     (RHON(2)/(GAMMA(JT)*PN(2))) *UN(2)
      G2=(GAMMA(JT)-1.)*.5
      PWR=GAMMA(JT)/(GAMMA(JT)-1.)
      PT1=P1(L,JT)*(1.+G2*ZM1)**PWR
      PT2=P2(L,JT)*(1.+G2*ZM2)**PWR
      PTOT(JLBDY,JT)=PT2
      PT4=PN(2)*(1.+G2*ZM4)**PWR
      ZM1=SQRT(ZM1)
      ZM2=SQRT(ZM2)
      ZM4=SQRT(ZM4)
      WRITE (6,1002) ZM1,PT1,P1(L,JT)
      WRITE (6,1002) ZM2,PT2,P2(L,JT)
      WRITE (6,1002) ZM4,PT4,PN(2)
      RETURN
 1000 FORMAT (1X,29HA MACH DISC IS BEING INSERTED,3X,7HJLBDY =,I8)
 1001 FORMAT (10X,26HRHO,P,U,V/U,W/U,ZN--NORMSH)
 1002 FORMAT (13X,17HMACH,PT,P,1,2,3,4,4F13.5)
 1003 FORMAT (1X,2HX=,F14.7,61HMACH DISC CANNOT BE INSETRED UNTIL AFTER
     1DATA HAS BEEN STORED)
      END
```

```
*DECK MOC
      SUBROUTINE MOC(V,VCH,P,PCH,SGN,TANA,RHOAVG,UAVG,
     * VQRAVG,DLQR,ITYPE)
*MOC          CALCULATED BY METHOD OF CHARACTERISTICS

      COMMON /CBNDRY/ BNDDUM(650),DX,RNJ,JT,RC,DXQDSY,BNDRDU(6),TT(2)
      COMMON /CNTROP/ RHS2,RHS,RHS1
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CMLIM/ ZMLIM
      COMMON /CDPSIC/ DPSI1(2),DPSIC(2),PTPRE(2)

      DATA IPRESS,ISOLID,IREGPT /6HIPRESS,6HISOLID,6HIREGPT/

      PAVG=(P+PCH)*.5
      VQUAVG=(V+VCH)*.5
      UAVG2=UAVG*UAVG
      CSQ=SQRT(GAMMA(JT)*PAVG/RHOAVG)
      VQU2P1=VQUAVG*VQUAVG+1.
      SQRTVU=SQRT(VQU2P1)
      ZMAVG2=UAVG2*VQU2P1*RHOAVG/(PAVG*GAMMA(JT))
      IF (ZMAVG2.LT.ZMLIM) ZMAVG2=ZMLIM
      TANA=SQRT(1./(ZMAVG2-1.))
  300 CONTINUE

C*  CONTTANT PEESSURE BOUNDARY
      V=VCH-SGN*(PAVG*ALOG(P/PCH)/(TANA*RHOAVG*UAVG2)+CSQ*(VQRAVG/UAVG+
     1RHS1/(RHOAVG*UAVG2*UAVG*SQRTVU*TANA*DX)*(TANA+SGN*VQUAVG)+RHS2
     2/UAVG)*DLQR)

      RETURN
      END
```

```
*DECK NORMSH
      SUBROUTINE NORMSH(GAMMA)
*NORMSH        JUMP CONDINTIONS ACSOSS NORMAL SHOCK
      COMMON /CNSHK/ RHO(2),P(2),U(2),VQU(2),WQU(2),ZN(3)

C        ZN X  IS THE UNIT NORMAL TO THE SHOCK
      I=1
      WRITE (6,1) RHO(I),P(I),U(I),VQU(I),WQU(I),ZN(I)
      QN1=U(1)*(ZN(1)+VQU(1)*ZN(2)+WQU(1)*ZN(3))
      RHOQQ=QN1*QN1*RHO(1)
      GP=GAMMA*P(1)
      ZMACH2=RHOQQ/GP
      P(2)=P(1)*(1.+2.*GAMMA/(GAMMA+1.)*(ZMACH2-1.))
      RHO(2)=RHO(1)*(GAMMA+1.)*ZMACH2/((GAMMA-1.)*ZMACH2+2.)
      QN2=QN1*RHO(1)/RHO(2)
      U(2)=U(1)+(QN2-QN1)*ZN(1)
      U1QU2=U(1)/U(2)
      VQU(2)=VQU(1)*U1QU2+(QN2-QN1)*ZN(2)/U(2)
      WQU(2)=WQU(1)*U1QU2+(QN2-QN1)*ZN(3)/U(2)
      I=2
      WRITE (6,1) RHO(I),P(I),U(I),VQU(I),WQU(I),ZN(I)
    1 FORMAT (7F16.[illegible])
      RETURN
      END
```

```
*DECK ONEDIM
      SUBROUTINE ONEDIM(JHOLD,JTDUM,I1D,IGO,VGUESS,PCRIT)
*ONEDIM      -ONEDIM-  CALUULATES ONE-DIMENSIONAL FLOW PROPERTIES
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CNSHK/ RHON(2),PN(2),UN(2),VQUN(2),DUM(5)
      COMMON /CXDISC/ XMDISC,XSAVE,IDISC,MDISCC
      COMMON /CINPUT/ PT(40,2),DUMINP(648)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CPTSLP/ XJUMP
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4  ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2),TT(1,2)
      COMMON /CINIT/ NJJ(2),DUMIN1(5),X,XL,IPRINT,DUMIN2(5)
      COMMON /CDECID/ ZMACHH(10),Y1DHLD(10),XHLD(10),VQUHLD(10)
      COMMON /CBDYPR/ XBDY(4)
      COMMON /CBITS/ BITS,BLANK
      COMMON /CJLBYS/ JLBDYS(2)
      LOGICAL MDISCC
      DATA ITIME /0/
      DATA PTOTAL/1.E+15/
      J=JHOLD
      P1D=PBAR(JHOLD,JT)
      IF (PTOTAL.NE.BITS) GO TO 100
C*  COMPUTE TOTAL PRESSURE FROM PREVIOUS X-STATION THE FIRST TIME THROUG
      CALL TABPRT (1HY,Y,10,10)
      CALL TABPRT (3HRHO,RHO,10,10)
      CALL TABPRT (3HVQU,VQU,10,10)
      CALL TABPRT (3H  U,  U,10,10)
      CALL TABPRT (3H  P,  P,10,10)
      PSATIC=PN(2)
      ZMACH2=RHON(2)*UN(2)*UN(2)*(1.+VQUN(2)*VQUN(2))/(GAMMA(JT)*PN(2))
      ZMACH=SQRT(ZMACH2)
      TTQTS=1.+GAM1(JT)*.5*ZMACH2
      PTOTAL=PSATIC*TTQTS**(GAMMA(JT)/GAM1(JT))
      POWER=(GAMMA(JT)+1.)/(2.*GAM1(JT))
      AQAST=(2.*TTQTS/(GAMMA(JT)+1.))**POWER/ZMACH
      YSONIC=Y(JLBDY,JT)*SQRT(1./AQAST)

C*  COMPUTE PROPERTIES AT CURENT X-STATION
  100 PSATIC=P1D
      IF (ITIME.GT.2) DV=ABS(VQUHLD(2)-VQUHLD(1))
      XJUMP=AMAX1 (.020,DV)
      XJUMP=AMIN1 (.100,XJUMP)
      XJUMP=-XJUMP
      IF (I1D.EQ.0) XJUMP=-.015
      IF (PSATIC.LT.PTOTAL) GO TO 200
      GO TO 350
  200 TTQTS=(PTOTAL/PSATIC)**GAM1QG(JT)
      ZMACH=SQRT(2.*(TTQTS-1.)/GAM1(JT))
      IF (ZMACH.GT.1.) ISUPER=1
      IF (I1D.EQ.0) OLDAQA=AQAST
      AQAST=(2.*TTQTS/(GAMMA(JT)+1.))**POWER/ZMACH
C*        ASSUME AXISYMMETRIV FLOW
      YNQYOL=SQRT(AQAST/OLDAQA)
```

```
C*  YNQYOL IS THE RATIO OF NEW Y TO YOLD
      K=1
      YBAR(JLBDY,JT)=YNQYOL*Y(JLBDY,JT)
      SLOPE(K,JT)=-VQU(JLBDY,JT)+2.*(YBAR(JLBDY,JT)-Y(JLBDY,JT))/DX
  400 CONTINUE
      IGO=1
C*  BNDRY GUESSES -SLOPE- AND CALCULATES ALL QUANTITIES ON THE BOUNDARY
C*  INITIAL GUESS IS THET SLOPE IS SAME AS LAST TIME
C*  ONEDIM TAKES THE PRESSURE CORRESPONDING TO THE SLOPE AND CALCULATES
CE  OF THE ONE DIMENSIONAL FLOW

      TOL=ABS(SLOPE(K,JT)-VQUBAR(J,JT))
      IF (X.GT.XBDY(3)) WRITE (6,4028) VQUBAR(J,JT),SLOPE(K,JT),TOL
     1,PBAR(J,JT)
      IF (TOL.LT..001) GO TO 390
      IF (IID.GT.10) GO TO 380
      VGUESS=VQUBAR(J,JT)
      CALL PTSLP (VQUBAR(J,JT),SLOPE(K,JT),IID,VPTSL2,1.)
      IF (PBAR(J,JT).LT.PCRIT) GO TO 180
C*  FLOW WENT SUBSONIC IN MAIN STREAM.  MAKE SURE NEW GUWSS ALLOWS FLOW
      IF (VQUBAR(J,JT).LT.VGUESS) GO TO 180
      VQUBAR(J,JT)=VGUESS+XJUMP
      GO TO 180
C*  STATIC PRESSURE IS HIGHER THAN TOTAP PRESSURE--DEXREASE VQU
  350 VQUBAR(J,JT)=VQUBAR(J,JT)+.873*XJUMP
  180 RETURN
  380 WRITE ( 6,1223) SLOPE(K,JT),VGUESS,PBAR(JHOLD,JT),TOL,JHOLD
      SLOPE(K,JT)=VQUBAR(J,JT)
  390 WRITE (6,1000)PTOTAL,PSATIC,ZMACH,AQAST,YBAR(JLBDY,JT),SLOPE(K,JT)
      II=1
      IGO=2
      IDIM=10
      I=IDIM
  300 VQUHLD(I)=VQUHLD(I-1)
      XHLD(I)=XHLD(I-1)
      Y1DHLD(I)=Y1DHLD(I-1)
      ZMACHH(I)=ZMACHH(I-1)
      I=I-1
      IF (I.GT.1) GO TO 300
      VQUHLD(I)=SLOPE(K,JT)
      XHLD(I)=X
      Y1DHLD(I)=YBAR(JLBDY,JT)
      ZMACHH(I)=ZMACH
      ITIME=ITIME+1
      ICHECK=0
      IF (VQUHLD(3).GT.VQUHLD(2)) ICHECK=ICHECK+1
      IF (VQUHLD(4).GT.VQUHLD(3)) ICHECK=ICHECK+1
      IF (ICHECK.GE.2) GO TO 420
      IF (ZMACHH(1).LT.1.) GO TO 440

C*  ITERATION CONVERGED
C*  FLOW HAS GONE SUPERSONIC SMOOTHLY
      JLBDY=1
      JLBDYS(1)=1
      MDISCC=.FALSE.
      IDISC=0
```

```
      XMDISC=BITS
      XSAVE=BITS
      GO TO 440
C*   THROAT SHAPE IS APPROACHING A CUSP--MDISCC ID TOO FAR DOWNSTREAM
  420 ZMNEW=ZMACHH(1)*2.-ZMACHH(2)
      IF (ZMNEW.LT.1.) GO TO 440
C*   NOT CLOSE ENOUGH TO SONIC POINT YET TO BE SURE THROAT IS APPORACHING
      CALL TABPRT (6HM,Y,XV,ZMACHH,40,10)
C*   SET UP FOR NEW RESRART
      IDISC=2
      PTOTAL=BITS
      ITIME=0
      DV=0.
  440 JLBDY2=JLBDY-1
      IF (JLBDY2.LE.0) GO TO 1020
      U1D=ZMACH*SQRT(GAMMA(JT)*TT(II,JT)*TTQTS)
      DO 1010 J=1,JLBDY2
      P(J,JT)=PSATIC
      PT(J,JT)=PTOTAL
      ZMN(J,JT)=ZMACH
      U(J,JT)=U1D
      VQU(J,JT)=0.
 1010 CONTINUE
 1020 RETURN
 1000 FORMAT (1X,26HPTOTAL,PSATIC,MN,AQAST,Y1D,5F13.5,5HSLOPE,F13.5)
 1223 FORMAT (1X,28HFAILURE OF ONE-DIM ITERATION,/,3X,23HSLOPE,VGUESS,PB
     1AR,TOL,J,4F18.7,I8)
 4028 FORMAT (1X,16HONEDIM ITERATION,4F14.7,21HVQUBAR,SLOPE,TOL,PBAR)
      END
```

```
*DECK PBOLIC
      SUBROUTINE PBOLIC(K)
*PBOLIC       COMPUTES A SINGLE STEP IN THE SOLN FO A GENERALIZED PARABOL
      COMMON /CTHETA/ THETA,II
      COMMON /CAAAA/ AAAA
      COMMON /CVISHK/ A2(3,1),A1(3,1),VISDUM(6)
      COMMON /CENDS/ JSTART,JEND
      COMMON /CPBOLI/ A(46,1),ALPHA(1,1),BETA(46,1),GAMM(46,1),
     1 DELTA(46,1)
      COMMON /CTRIDI/ COEFL(46),COEFC(46),COEFR(46),RHS(46)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2 ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3 ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2),TT(1,2)
      COMMON /CJLBYS/ JLBDYS(2)
      COMMON /TKEIN/ XTKE(20),TKEBDY(20),NTKE,DUMTKE(122)
      COMMON /CTKEPR/ XTKEPR,XTPRSH,XTPRSF
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1 ,DX3,TS,DPSI(2)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CLOGIC/DDD(4),DUAL,DDDD(9)
      COMMON /CRFLCT/ IRFLCT,ICHNG,ISIGN
      LOGICAL DUAL
C*  GAMMN- IS THE VALUE OF GAMM AT THE NEW S-STEP--TWO LEVELS OF GAMM
C*         ARE REQUIRED.  ONLY ONE VALUE OF THE OTHER VARIABLES IS REQUI
C*  -J-   ID THE CROSS STREAM INDEX
C*  -K-   IS THE RUNNING INDEX FOR DEPENDENT VARIABLES
C*  -NE-  REPRESENTS TURBULENT KINETIC ENERGY
C*  THETA- IS THE CRANK-NICHOLSON PARAMETER--THETA=0 IS EXPLICIT
C*                                         --THETA=1 IS IMPLICIT
C*  JDUAL COMPRESSES MATRIX IN DUAL FLOW CASE TO KEEP IT TRIDIAGONAL
      JDUAL=0
      NJM1=JEND-1
  100 JSP1=JSTART+1
      THETA1=1.-THETA

C*  SETUP RHS, THEN UP-DATE BETA,GAMM,DELTA  FOR NEW X-STEP
      AAA=ALPHA(II,K)*DX/(DPSI(JT)*DPSI(JT))
      AAAA=AAA*THETA1*.5
      DO 200 J=JSP1,NJM1
      J1=J+JDUAL
      COEFL(J1)=AAAA*(BETA(J,K)+BETA(J-1,K))
      COEFR(J1)=AAAA*(BETA(J,K)+BETA(J+1,K))
  200 RHS(J1) =COEFL(J1)*A(J-1,K)+(1.-COEFL(J1)-COEFR(J1)+(THETA1*DX*
     1DELTA(J,K)))*A(J,K)+COEFR(J1)*A(J+1,K)+THETA1*GAMM(J,K)*DX

C*  RHS USES GAMM AT BOTH OLD AND NEW STATIONS--THEREFORE IT APPEARS
C*  IN BOTH DO LOOPS

      IF (Y(JLBDY,JT).GT..0001) GO TO 230
C*  AXIS OF SYMMETRY B.C.
      J=JSTART
      COEFLJ=0.
      COEFRJ=AAA*THETA1*(BETA(J,K)+BETA(J+1,K))
      J1=J+JDUAL
      RHS(J1)=(1.-COEFRJ+DX*THETA1*DELTA(J,K))*A(J,K)+COEFRJ*A(J+1,K)
```

```
      1+THETA1*DX*GAMM(J,K)
C*  THIS IS NEEDED WHEN SHOCK IS CLOSE TO AXIS OF SYMMETRY
      COEFR(J1)=AAAA*(BETA(J,K)+BETA(J+1,K))
  230 IF (DUAL) GO TO 600

C*  UPDATE OUTER B.C.
C*  INCLUDE JUMP CONDITIONS IN RHS
  250 CALL TKESHK (2,K)
      IF (.NOT. DUAL.OR.JT.EQ.2) CALL LSPFIT (XTKE,TKEBDY,NTKE,X,A(JEND
     1,K),1,0)

C*  UPDATE COEFFICIENTS -BETA,GAMM, AND DELTA--
  260 CALL COEFF(K)

      AAA=ALPHA(II,K)*DX/(DPSI(JT)*DPSI(JT))
      AAAA=THETA*AAA*.5
      DO=300DU*USP1,NJM1
      RHS(J1)=RHS(J1)+THETA*DX*GAMM(J,K)
      COEFR(J1)=-AAAA*(BETA(J,K)+BETA(J+1,K))
  300 COEF[illegible]DX*DELTA(J,K)

*   AXIS OF SYMMETRY B.C.
      IF (Y(JLBDY,JT).GT..0001) GO TO 350
      IF (ICHNG.EQ.1) GO TO 350
  310 J1=JSP1+JDUAL
      COEFR(J1)=COEFR(J1)-.33333333*COEFL(J1)
      COEFC(J1)=COEFC(J1)+1.33333333*COEFL(J1)
      IF (ICHNG.NE.1) GO TO 350
      GO TO 370

  350 IF (DUAL) GO TO 500
C*  OUTEE (FREE-STREAM) B.C.
  360 RHS(NJM1)=RHS(NJM1)-COEFR(NJM1)*A(JEND,K)

C*  INCLUDE JUMP CONSITIONS IN LHS COEFFICIENTS
      CALL TKESHK (1,K)
      IF (ICHNG.EQ.1) GO TO 310
  370 JT=1
      JSP1=JSP1+JDUAL
      CALL TRIDIA (JSP1,NJM1)

      IF (DUAL) NJM1=NJJ(1)+1
      LOCATE=3
  390 DO 400 J=JSP1,NJM1
      J1=J-JDUAL
  400 A(J1,K)=RHS(J)
      A(1,K)=(4.*A(2,K)-A(3,K))*.33333333
      IF (ICHNG.EQ.0.OR.ICHNG.EQ.3) GO TO 410
      IF (IRFLCT.EQ.3) GO TO 410
C*  SHOCK IS WITNIN ONE GRID POINT OF AXIS OF SYMMETRY
      ICHNG=2
      A(1,K)=A(1,K)-FLOAT(ISIGN)*(A2(1,1)-A1(1,1))
  410 IF (DUAL.AND.JT.EQ.1) GO TO 630
C*  SHOCK IS WITHIN TWO POINTS OF AXIS OF SYMMETRY
```

```
      IF (ICHNG.EQ.3) A(1,K)=A(1,K)+.33333333*FLOAT(ISIGN)*(A2(1,1)
     1-A1(1,1))
      NJM1=NJM1+1
      IF (X.GE.XTKEPR) CALL TABPRT (3HTKE,A,JEND,10)
      IF (IRFLCT.LE.1) RETURN
      IF (IRFLCT.EQ.2) GO TO 440
C*   --IRFLCT=0--   NORMAL POINT
C*   --IRFLCT=2--   REFLECTION FROM MAXH DISC
C*   --IRFLCT=3--   REGULAR REFLECTION
C*   REFLECTION OF SHOCK FROM AXIS OF SYMMETRY
      LL=1
      GO TO 450
  440 A(JLBDY,K)=A(JLBDY,K)*A1(1,K)/A2(1,K)
      CALL TKESHK (3,K)
      LL=3
  450 IRFLCT=1
      J=JLBDY
      ARATIO=A2(LL,K)/A1(LL,K)
  460 A(J,K)=A(J,K)*ARATIO
     J$8-(J.LE.1) GO TO 470
      GO TO 460
  470 CONTINUE
      JLBDY1=JLBDY+2
      IF (X.LT.XTKEPR) GO TO 480
      CALL TABPRT (1HA,A,JLBDY1,10)
      CALL TABPRT (2HA2,A2,6,6)
  480 CONTINUE
      RETURN
C*   SET UP DUAL FLOW CASE
  500 LOCATE=1
      GO TO (570,550),JT
  550 JT=1
      JSTART=JLBDY
      JEND=NJJ(1)
      NJM1=NJJ(1)-1
      JSP1=JSTART+1
      JDUAL=1
      GO TO (260,100),LOCATE
  570 J=NJJ(1)+1
      CJP1=(BETA(J   ,K)+BETA(J+1,K))/(DPSI(2)*(DPSI(1)+DPSI(2)))
      CJM1=(BETA(J-1,K)+BETA(J-2,K))/(DPSI(1)*(DPSI(1)+DPSI(2)))
      COEFL(J)=-THETA*ALPHA(II,K)*DX*CJM1
      COEFR(J)=-THETA*ALPHA(II,K)*DX*CJP1
      COEFC(J)=1.-COEFR(J)-COEFL(J)-THETA*DX*DELTA(J,K)
      RHS(J)=RHS(J)+THETA*DX*GAMM(J,K)
      NJM1=NJJ(1)+NJJ(2)-1
      JT=2
      GO TO 360
  600 LOCATE=2
      GO TO (620,550),JT
  620 J=NJJ(1)+1
      COEFL(J)=ALPHA(II,K)*THETA1*(BETA(J-1,K)+BETA(J-2,K))/(DPSI(1)*(
     1DPSI(1)+DPSI(2)))*DX
      COEFR(J)=ALPHA(II,K)*THETA1*(BETA(J   ,K)+BETA(J+1,K))/(DPSI(2)*
     1(DPSI(1)+DPSI(2)))*DX
```

```
      RHS(J)=COEFL(J)*A(J-2,K)+(1.-COEFL(J)-COEFR(J)+(THETA1*DX*DELTA(J,
     1K)))*A(J,K)+COEFR(J)*A(J+1,K)+THETA1*GAMM(J,K)*DX
  630 JEND=NJJ(1)+NJJ(2)
      JSP1=NJJ(1)+2
      JDUAL=0
      JSTART=NJJ(1)+1
      JT=2
      NJM1=JEND-1
      GO TO (250,250,700),LOCATE
  700 JSP1=NJJ(1)+1
      GO TO 390

      END
```

```
*DECK PRINT
      SUBROUTINE PRINT
*PRINT        **PRINT**  SSFD OUTPUT ROUTINE
      DIMENSION YS(23,2),PSIS(23,2)
      EQUIVALENCE (YS,Y),(PSIS,PSI)
      COMMON/FILK/CSC
      COMMON/FILES/ORGF,UPDF,NEWF,SCRF
      COMMON/KEYS/KEY(11)
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,ENDJOB
     1  ,SOLID(2,2)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),            R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JTT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON /CSHK/ TANS1,DSHOCK,PSISHK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /COLDPT/ OLDPT(46),PT1,PT2
      COMMON /CSHMN/ ZM1,ZM2
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CINPUT/ PT(40,2),DU(1,2),PRESS(40,2),YIN(40,2),ZM(40,2)
     1 ,THETA(40,2),TANTH(40,2)
     2   ,XLOW(20,2),YLOW(20,2),XUP(20,2),YUP(20,2),NSTRM(2),NPTSL(2)
     3  ,NPTSU(2),PUP(20,2),PLOW(20,2)
      LOGICAL AXISYM,DUAL,SSTRM,PCONT,BARPRT,ENDJOB,SOLID
      LOGICAL DSHOCK
      COMMON /CPBOLI/ TKE(46),PBIDUM(139)
      COMMON /CVISHK/ TKE2(3),TKE1(3),VISDUM(6)
      COMMON/IOFILE/ TAPIN,TAPOT
      LOGICAL        TAPIN,TAPOT
      COMMON /FILINO/ KREC,KXX
      DATA JB,PRDUM,ENTRYI/0,1.E+15,T/
      LOGICAL ENTRYI


      XLJ=XL/2.
      XJ=X/2.
      IF(ENTRYI) KREC=0
      KXX    = CSC*XJ+.5
      ENTRYI= .FALSE.
      KREC   = KREC+1
      IF(TAPOT) WRITE (3) KREC,KXX,YS,PSIS,P,PT,ZMN,TKE,
     *                       NJJ,XLJ,DUAL

      JT=JTT
      IADJUS=0
      IF (JT.EQ.2) IADJUS=NJJ(1)
      TANS=TANS1
C*  FOR DUAL FLOWS, PRINT BOTH STREAMS AT ONCE, BUT PRINT UPPER STREAN F
      WRITE (6,1) X
      WRITE (6,2000)
C***  WRITE (6,2)
```

```
   10 I=NJJ(JT)
      EXPON=1./GAM1QG(JT)
      JSM1=0
      IF (XSHOCK(JT).GT.X) GO TO 20
      JSM1=IABS(JSHOCK)
      IF (DSHOCK) GO TO 15
      L=2
      JSM1=JSM1+1
      GO TO 20
   15 L=1

   20 IT=I+IADJUS
      TI=SQRT(TKE(IT))
      WRITE (6,3000) I,Y(I,JT),ZMN(I,JT),VQU(I,JT),PT(I,JT),P(I,JT),RHO(
     * I,JT),U(I,JT),TI
C**20 WRITE (6,3) I,Y(I,JT),ZMN(I,JT),VQU(I,JT),PT(I,JT),P(I,JT),RHO(I,J
C**  1T),U(I,JT)

      IF (I.NE.JSM1) GO TO 100

C*  PTU,PT2,ZM1,ZM2 ARE COACLUATED IN --SHOCK2
      WRITE (6,4)

      IF (.NOT.DSHOCK) GO TO 200
C*  PRINT DOWN-SHOCK INFORMATION
      TI=SQRT(TKE2(L))
      WRITE (6,3001) YSHOCK,ZM2,VQU2(L,JT),PT2,P2(L,JT),RHO2(L,JT),U2
     1(L,JT),TANS,TI
C***  WRITE (6,3) JB,YSHOCK,ZM2,VQU2(L,JT),PT2,P2(L,JT),RHO2(L,JT),U2(L
C**  1,JT),TANS1
      TI=SQRT(TKE1(L))
      WRITE(6,3001) YSHOCK,ZM1,VQU1(L,JT),PT1,P1(L,JT),RHO1(L,JT),U1
     1(L,JT),TANS1,TI
C**   WRITE (6,3) JB,YSHOCK,ZM1,VQU1(L,JT),PT1,P1(L,JT),RHO1(L,JT),U1(L
C**  1,JT),TANS1
   60 WRITE (6,4)
  100 I=I-1
      IF (I.GT.0) GO TO 20

      IF (JT.EQ.1) RETURN
      JT=1
      IADJUS=0
      WRITE (6,5)
      GO TO 10

C*  PRINT UP-SHOCK INFORMATION
  200 TI=SQRT(TKE1(L))
      WRITE(6,3001) YSHOCK,ZM1,VQU1(L,JT),PT1,P1(L,JT),RHO1(L,JT),U1
     1(L,JT),TANS,TI
C*200 WRITE (6,3) JB,YSHOCK,ZM1,VQU1(L,JT),PT1,P1(L,JT),RHO1(L,JT),U1(L
C*   1,JT),TANS1
      TI=SQRT(TKE2(L))
      WRITE(6,3001) YSHOCK,ZM2,VQU2(L,JT),PT2,P2(L,JT),RHO2(L,JT),U2
     1(L,JT),TANS,TI
C*    WRITE (6,3) JB,YSHOCK,ZM2,VQU2(L,JT),PT2,P2(L,JT),RHO2(L,JT),U2(L
C*   1,JT),TANS1
```

```
      GO TO 60

    1 FORMAT (    1H1,10X,5HX/R =,2X,F9.4,///)
 2000 FORMAT (14X,1HY,11X,4HMACH,9X,4HFLOW,10X,5HTOTAL,10X,6HSTATIC,7X,
     17HDENSITY,10X,2HU-,10X,5HSHOCK,4X,10HTURBULENCE,/,25X,6HNUMBER,8X,
     25HANGLE,8X,8HPRESSURE,7X,8HPRESSURE,20X,8HVELOCITY,7X,5HANGLE,6X,
     36HINTEN.,//)
C***2 FORMAT (15X,1HY,12X,4HMACH,12X,4HFLOW,11X,5HTOTAL,11X,6HSTATIC
C*** 1,10X,7HDENSITY,12X,2HU-,12X,5HSHOCK,/,27X,6HNUMBER,11X,5HANGLE,9X,
C*** 28HPRESSURE,8X,8HPRESSURE,24X,8HVELOCITY,9X,5HANGLE,//)
C***3 FORMAT (14,5F15.4,4X,3F15.4)
 3000 FORMAT(I4,2F14.4,F12.4,2F14.4,F15.4,F14.4,14X,F13.4)
 3001 FORMAT(4X,2F14.4,F12.4,2F14.4,F15.4,2F14.4,F13.4)
    4 FORMAT (/)
    5 FORMAT (////)
      END
```

```
*DECK PTSLP
      SUBROUTINE PTSLP(X,Y,K,XH,TYPE)
*PTSLP         GENERAL LINEAR INTERP ROUTINE   --PTSLP--
      DIMENSION XH(1)
      COMMON /CPTSLP/ XJUMP

      K=K+1
      XH(2)=XH(1)
      XH(1)=X
C*   STORE Y VALUES IN XH(3) AND XH(4)
      XH(4)=XH(3)
      XH(3)=Y
      IF (K.EQ.1) GO TO 10

C*   **TYPE=0.** FINDS THE SOLUTION WHERE Y=0.
C*   **TYPE=1.** FINDS THE SOLUTION WHREE X=Y

      SLOPE=(XH(4)-XH(3))/(XH(2)-XH(1))
      X=(XH(1)*SLOPE-XH(3))/(SLOPE-1.*TYPE)
      GO TO 20

C*   FIRST TIME THROUGH
   10 X=(3.*XH(1)+XH(3))*.25*TYPE+XH(1)*(1.-TYPE)*(1.-XH(3))
C*   CHECJ TO BE SURE NEW GUESS IS FOR ENOUGH AWAY FROM OLD GUESS WHEN OL
C(   IS NEAR ZERO
      IF (ABS(XH(1)).LT.(1.E-4)) X=XH(1)-XJUMP*ABS(XH(3))*10.
   20 IF (XJUMP.LT.0.) GO TO 30
      IF (X.LT.(1.-XJUMP)*XH(1)) X=XH(1)*(1.-XJUMP)
      IF (X.GT.(1.+XJUMP)*XH(1)) X=XH(1)*(1.+XJUMP)
      RETURN

C*   XJUMP.LT.0 IS SIGNAL THAT **X** MUST BE ALOWED TO CHANGE SIGN DURINT
   30 IF (X.LT.(XH(1)+XJUMP)) X=XH(1)+XJUMP
      IF (X.GT.(XH(1)-XJUMP)) X=XH(1)-XJUMP
      IF (K.NE.2) RETURN
C*   ALLOW 2ND GUESS TO MOVE BY 2 XJUMP IF FIRST GUESS WAS IN WRONT DIREC
      IF (X.EQ.XH(2)) X=2.*XH(2)-XH(1)
      RETURN
      END
```

```
*DECK RESETM
      SUBROUTINE RESETM(EXPON,LP2,I)
*RESETM       CORRECTS MN .LT. 1
      COMMON /CBNDRY/ DUM(652),JT,DUMM(8),TT(2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /COLDPT/ OLDPT(23,2),OLDPTS(2)
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CFRONT/ ISHOCK,YSHK,PSISHK,FRACTN
      COMMON /CRH/ JSH,L,TANS,U2G,SGN,KPRESS
      COMMON/QSHKPT/SHKPRT
      LOGICAL SHKPRT

C   IF I=1 RESETM HAS BEEN CALLED FROM SHOCK2
      ZM2=1.02
      TSQTT=1./(1.+(GAMMA(JT)-1.)*.5*ZM2)
      P2(LP2,JT)=OLDPTS(2)*TSQTT**EXPON
      RHO2(LP2,JT)=P2(LP2,JT)/(TSQTT*TT(JT))
      Q2=ZM2*GAMMA(JT)*P2(LP2,JT)/RHO2(LP2,JT)
      U2(LP2,JT)=SQRT(Q2/(1.+VQU2(LP2,JT)*VQU2(LP2,JT)))
      IF(.NOT.SHKPRT) GO TO 10
      WRITE (6,1) U2(LP2,JT),RHO2(LP2,JT),P2(LP2,JT),JT
      WRITE (6,1) TANSO,TANS
   10 CONTINUE

      RETURN
    1 FORMAT (2X,4HEXIT,3F16.6,I8)
      END
```

```
*DECK RESTRT
      SUBROUTINE RESTRT( ICASE )
*RESTRT        **RESTRT**  STORES DATA FOR RESTART

      COMMON/TROUBL/ ERR,ENDJOB
      LOGICAL        ERR,ENDJOB
      COMMON /CXDISC/ XMDISC,XSAVE,IDISC,MDISCC
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1   ,DX3,TS,DPSI(2)
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CINPUT/ PT(40,2),DUMIN(648)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CCRNER/ NPTSM1,KDUM,ICRNER,XCRNER
      COMMON /CFRONT/ SHOCKI(1),YSHK,PSHOCK,FRACTN
      COMMON /CRH/ SHJ(1),L,TANS,U2G,SGN,KPRESS
      COMMON /CSHK/ TANS1(1),DSHOCK,PSISHK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4  ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2),TT(1,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CJLBYS/ JLBDYS(2)
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,
     1DUMEND,SOLID(2,2)
      COMMON /CSHFR/ IFRDUM,HUGE
      COMMON /CSHK2/ IFIRST,II
      DIMENSION HOLDV (574),IHOLDV(11)
      LOGICAL AXISYM,MDISCC
      DATA ISTOR /0/

C*   IDISC=10 MEANS FLOW WENT SUBDONIC WHEN ISSERTING MACH DISC
C*   ISISC=2 MEANS MACH DISC HAS ALL READY BEEN INSERTEDP
CR   IDISC=-1    MAANS MACH DISC WILL BE INSERTED AS SOON AS DATA HAS BEEN
      NAMELIST /B/ HOLDV,IHOLDV
      GO TO (100,500,700,800),ICASE

C*   ICASE=1 IMPLIES STORE DATA FOR LATER RESTART
  100 IF (ISTOR.EQ.1) RETURN
      WRITE (6,999) X
      IF (IDISC.EQ.0) GO TO 110
C*   RESET XMDISC IF IT HAS VEEN DELAYED BECAUSE DATA HAS NOT BEEN STORED
      XMDISC=X+.2*DX
      XCRNER=XMDISC
  110 CALL PRINT
      ISTOR=1
      IDISC=1
      XMDMIN=XSAVE
      XMDMAX=1.E8
      HOLDV(1)=XMDISC
      HOLDV(2)=XSAVE
      HOLDV(3)=X
C*   /CSHOCK/
      DO 120 M=4,83
  120 HOLDV(M)=P1(M-3,1)
```

```
C*   /CSHK/
      DO 140 M=84,93
  140 HOLDV(M)=TANS1(M-83)
C*   /CBNDRY/
      DO 160 M=94,369
  160 HOLDV(M)=RHO(M-93,1)
      DO 180 M=370,420
  180 HOLDV(M)=ZMN(M-369,1)
      DO 200 M=421,424
  200 HOLDV(M)=SLOPE(M-420,1)
C*   /CINPUT/
      DO 210 M=425,504
  210 HOLDV(M)=PT(M-424,1)
      DO 215 M=505,524
  215 HOLDV(M)=Y2(M-504,1)
      HOLDV(525)=PSI2(1,1)
      HOLDV(526)=PSI2(1,2)
      HOLDV(527)=DX2
      HOLDV(528)=DX3
      HOLDV(529)=ICRNER
      HOLDV(530)=JLBDYS(1)
      HOLDV(531)=JLBDYS(2)
      HOLDV(532)=JLBDY
      HOLDV(533)=JLBDY1
      HOLDV(534)=SYBDY
      HOLDV(535)=IFRDUM
      HOLDV(536)=IFIRST
C*   /CFRONT/
      DO 220 M=565,568
  220 HOLDV(M)=SHOCKI(M-564)
C*   /CRH/
      DO 230 M=569,574
  230 HOLDV(M)=SHJ(M-568)
      IF (MDISCC) CALL TABPRT(5HHOLDV,HOLDV,574,10)
      RETURN

C*   ICASE=2 IMPLIES RESTART FROM STORED PROFILES
  500 ISTOR=0
  505 WRITE (6,998)
      XSAVE=HOLDV(2)
      X=HOLDV(3)
      DO 520 M=4,83
  520 P1(M-3,1)=HOLDV(M)
      DO 540 M=84,93
  540 TANS1(M-83)=HOLDV(M)
      DO 560 M=94,369
  560 RHO(M-93,1)=HOLDV(M)
      DO 580 M=370,420
  580 ZMN(M-369,1)=HOLDV(M)
      DO 600 M=421,424
  600 SLOPE(M-420,1)=HOLDV(M)
      DO 610 M=425,504
  610 PT(M-424,1)=HOLDV(M)
      DO 615 M=505,524
  615 Y2(M-504,1)=HOLDV(M)
      PSI2(1,1)=HOLDV(525)
```

```
      PSI2(1,2)=HOLDV(526)
      DX2=HOLDV(527)
      DX3=HOLDV(528)
C*  DX3 WILL BE DESTROYED IN -SSFD-
      IF (DX3.LT.DX2) DX2=DX3
      SYBDY    =HOLDV(534)
      JLOW    =IHOLDV( 1)
      JSHOCK  =IHOLDV( 2)
      JLBDYS(1)=IHOLDV(3)
      JLBDYS(2)=IHOLDV(4)
      IFRDUM    =IHOLDV(5)
      IFIRST    =IHOLDV(6)
      JSH       =IHOLDV(7)
      L         =IHOLDV(8)
      NPTSM1    =IHOLDV(9)
      ICRNER    =IHOLDV(10)
      DO 620 M=565,568
  620 SHOCKI(M-564)=HOLDV(M)
      DO 630 M=569,574
  630 SHJ(M-568)=HOLDV(M)
      IF (.NOT.AXISYM) GO TO 641
      DO 640 M=232,277
  640 R(M-231,1)=HOLDV(M)
  641 CONTINUE
      JT=2
      JLBDYS(1)=1
      JLBDYS(2)=1
      JLBDY=1
      JLBDY1=2
      SYBDY=PSI(1,1)
      IFRDUM=0
      IFIRST=0
      CALL PRINT
      RETURN

  700 XMDISC=HOLDV(1)
C*  MDISC WAS TOO FAR DOWNSTREAM
      IF (XMDISC.LT.XMDMAX) XMDMAX=XMDISC
C*  FIND NEW GUESS FOR XMDISC
      XMDISC=XMDMIN+ .9*(XMDMAX-XMDMIN)
      WRITE (6,997) XMDMAX,XMDMIN,HOLDV(2),XMDISC
      IDISC=10
      GO TO 505

C*  RESTART FLOW FROM EXTERNAL (CARD) SOURCE
  800 ERR=.FALSE.
      READ (5,B)
      IF(ERR) RETURN
      ISTOR=1
      IDISC=0
      XCRNER=1.E8
      CALL TABPRT (5HHOLDV,HOLDV,574,10)
      GO TO 505

    5 FORMAT (1X,5(E13.6,1H,))
  997 FORMAT (1X,12HMAX XMDISC =,F14.7,5X,12HMIN XMDISC =,F14.7,5X,8HX S
```

```
     1AVE =,F14.7,5X,12HNEW XMDISC =,F14.7)
 998 FORMAT (1X,23HFLOW IS BEING RESTARTED)
 999 FORMAT (1X,47HDATA IS BEING STORED FOR POSSIBLE RESTART AT X=,
     1F14.7)
     END
```

```
*DECK RH
      SUBROUTINE RH(x,JT)
*RH            FINDS SOLUTION TO THE RANKINE-HUGONIOT EQUATIONS
      COMMON /CFRONT/ ISHOCK,YSHK,PSISHK,FRACTN
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),           R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JTT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON /CPTSLP/ XJUMP
      COMMON /CSHK/ TANS1,DSHOCK,PSHOCK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CCRNER/ NPTSM1,KDUM,ICRNER,XCRNER
      COMMON /CXPR/ XIPRT1.XIPRT2,XIPRT3,XIPRT4
      COMMON /CRH/       JSH,L,TANS,U2G,SGN,  KPRESS
      COMMON/QSHKPT/SHKPRT
      LOGICAL SHKPRT
      DIMENSION VPTSLP(8)

      II=1
      J=JSHOCK
      IF (J.LE.1) J=2
      KOUNT=0
      IF (x.GT.2.6.AND.U2G.LT.1.1) U2G=1.15
      TCRIT=TT(II,JT)/((GAMMA(JT)+1.)*.5)
C*  CALCULATE MAX U2 FOR ZERO STRENGTH XHOCK
C*  CALCULATE MIN U2 FOR SHOCK TO SONIC BELOCITY
      U2MIN=2.*(TT(II,JT)-TCRIT)/GAM1QG(JT)
     .U2MIN=SQRT(U2MIN/(1.+VQU2(L,JT)*VQU2(L,JT)))
      IF (KPRESS.EQ.1) GO TO 98
      U2MAX=U1(L,JT)*SQRT((1.+VQU1(L,JT)*VQU1(L,JT))/(1.+VQU2(L,JT)*
     1VQU2(L,JT)))
  100 U2(L,JT)=U2G
      IF (ICRNER.EQ.(-4).OR.ICRNER.EQ.(-3)) GO TO 99
  190 TANS=(U2(L,JT)-U1(L,JT))/(U1(L,JT)*VQU1(L,JT)-U2(L,JT)*VQU2(L,JT))
      RHO2(L,JT)=RHO1(L,JT)*((TANS-VQU1(L,JT))/(TANS-VQU2(L,JT)))*((
     1  1.+VQU2(L,JT)*TANS)/(1.+VQU1(L,JT)*TANS))
      P2(L,JT)=P1(L,JT)+(RHO1(L,JT)*U1(L,JT)*U1(L,JT)*(TANS-VQU1(L,JT))
     1  *(TANS-VQU1(L,JT))-RHO2(L,JT)*U2(L,JT)*U2(L,JT)*(TANS-VQU2(L,JT)
     2)*(TANS-VQU2(L,JT)))/(1.+TANS*TANS)
      GO TO 105
   98 ZM12=GAMMA(JT)*P1(L,JT)/(RHO1(L,JT)*U1(L,JT)*U1(L,JT))
      SIN2B=((P2(L,JT)-P1(L,JT))*(GAMMA(JT)+1.)/(P1(L,JT)*2.*GAMMA(JT))
     1  +1.)*ZM12
      U2(L,JT)=U2G
      T2=SGN*SQRT(SIN2B/(1.-SIN2B))
      TANS =(VQU1(L,JT)+T2)/(1.-VQU1(L,JT)*T2)
   99 VQU2(L,JT)=(U1(L,JT)*(1.+VQU1(L,JT)*TANS)/U2(L,JT)-1.)/TANS
      U2MAX=U1(L,JT)
      RHO2(L,JT)=RHO1(L,JT)*((TANS-VQU1(L,JT))/(TANS-VQU2(L,JT)))*((
     1  1.+VQU2(L,JT)*TANS)/(1.+VQU1(L,JT)*TANS))
  105 TS=P2(L,JT)/RHO2(L,JT)
      IF (TS.LT.TCRIT) GO TO 1055
```

```
      IF (TS.LT.TT(II,JT)) GO TO 1055
      IF (ICRNER.EQ.(-4).OR.ICRNER.EQ.(-3)) GO TO 1054
      U2G=U2G*1.03
      GO TO 1058
 1054 TS=.999*TT(II,JT)
 1055 U2(L,JT)=SQRT((TT(II,JT)-TS)*GAM2(JT)/(1.+VQU2(L,JT)*VQU2(L,JT)))

      TOL=ABS((U2G-U2(L,JT))/U2G)
      IF (X.GT.XIPRT1) WRITE (6,1098) U2G,U2(L,JT),TOL
      IF (KOUNT.GT.10) GO TO 108
      IF (TOL.LT..0005) GO TO 110
      XJUMP=.1
      U2GSV=U2G
      CALL PTSLP (U2G,U2(L,JT),KOUNT,VPTSLP,1.)
C*  CHECK TO BE SURE VELOCITY DECREASES ACROSS SHOCK
 1058 IF (U2G.LT.U2MAX) GO TO 100
  106 U2G=.9999*U2MAX
      IF (U2G.NE.U2GSV) GO TO 100
      IF(SHKPRT) WRITE(6,1102) U2G,VQU2(L,JT)
      U2G=.99995*U2MAX
      GO TO 100

  108 IF( .NOT.SHKPRT ) GO TO 1081
      WRITE (6,1100) U2G,U2(L,JT)
      WRITE (6,8)P1(L,JT),U1(L,JT),VQU1(L,JT),VQU2(L,JT)
 1081 CONTINUE

  110 CONTINUE
      RETURN

    8 FORMAT (1X,7F16.8)
 1098 FORMAT (1X,10HU2G,U2,TOL,3F14.7)
 1100 FORMAT (34HRANKINE HUGONIOT ITERATION FAILED.,/,5HU2G =,F16.6,
     1  4HU2 =,F16.6)
 1102 FORMAT (2X,55HR-H SOLUTION REQUIRES INCREASE IN VELOCITY ACROSS SH
     1OCK,2F16.6,2X,7HU2,VQU2)
      END
```

```
*DECK SEARCH
      SUBROUTINE SEARCH(XYZ)
*SEARCH          SEARCH FOR IMBEDDED SHOCKS    **SEARCH**
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CSHK/ TANS1,DSHOCK,PSISHK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CINIT/ NJJ(2),DUM(5),X,XL,IPRINT,DUMM(5)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),  Y(23,2),VQU(23,2)
     2  ,PSI(23,2),            R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4   ,PBOUND(2,2),DX,RNJ,JT,RC,DXODSY,PSI1,YCALC,SLOPE(2,2),TT(1,2)
      COMMON /CCRNER/ NPTSM1,K,ICRNER,CCRNER
      COMMON /CSERCH/ ISERCH,PSHOCK,JSHK
      COMMON /COLDPT/ OLDPT(46),PT1,PT2
      COMMON /CINPUT/ PT(40,2),DUMON(648)
      LOGICAL INSERT,DSHOCK,IPRINT

      IF (XSHOCK(1).EQ.X.OR.XSHOCK(2).EQ.X) RETURN
      IF (ISERCH.NE.1) GO TO 7
      CALL LSPFIT (PSI(1,JT),Y(1,JT),NJJ(JT),PSHOCK,YSHOCK,1,0)
      ISERCH=-1
      NJ=NJJ(JT)
      DO 231 J=2,NJ
      IF(YSHOCK.LT.Y(J,JT)) GO TO 2315
  231 CONTINUE
C*   SHOCK IS NOT IN THIS CHANNEL
      RETURN
 2315 JSHOCK=-J
      JLOW=J
      XSHOCK(JT)=X
      DSHOCK=.TRUE.
      ICRNER=-2
      PT1=PT(JSHOCK-1,JT)
      PT2=PT(JSHOCK,JT)
      L=1
      JM1=J-1
  235 P2(L,JT)=P(J,JT)
      P1(L,JT)=P(JM1,JT)
      VQU2(L,JT)=VQU(J,JT)
      VQU1(L,JT)=VQU(JM1,JT)
      U2(L,JT)=U(J,JT)
      U1(L,JT)=U(JM1,JT)
      RHO2(L,JT)=RHO(J,JT)
      RHO1(L,JT)=RHO(JM1,JT)
      IF (L.EQ.3) RETURN
      CALL LSPFIT (Y(1,JT),PSI(1,JT),NJ,YSHOCK,PSISHK,1,0)
    6 IF (IPRINT) WRITE(6,9) X,YSHOCK
      L=3
      GO TO 235

    7 RETURN
    9 FORMAT (1X,32HA SHOCK HAS BEEN DETECTED AT X= ,F9.4,1X,3HY =,F8.4)
      END
```

```
*DECK SHOCK
      SUBROUTINE SHOCK(X)
*SHOCK    CALCULATES JUMP CONDITIONS ACROSS A SHOCK -SHOCK-
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,HARPRT,ENDJOB
     1 ,SOLID(2,2)
      COMMON /CHNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),         R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4   ,PBOUND(2,2),DX,RNJ,JTT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2),TT(1,2)
      COMMON /CSHK/ TANS1,DSHOCK,PSHOCK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CHOLD/ RHOHLD(6),VQUHLD(6),UHLD(6),PTHLD(6),PSIHLD(6)
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),YDUM(20)
      COMMON /CINIT/ NJJ(2),NJJM1(2),IDUM(11)
      COMMON /COLDPT/ OLDPT(23,2),OLDPTS(2)
      COMMON /CCHAR/ PCH(1,2),UCH(1,2),RHOCH(1,2),VQUCH(1,2),YCH(1,2)
     1,RCH(1,2)
      COMMON /CINPUT/ PT(40,2),DUMINP(648)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CCRNER/ NPTSM1,KDUM,ICRNER,XCRNER
      COMMON /CXPR/ XIPRT1,XIPRT2,XIPRT3,XIPRT4
      COMMON /CRH/       JSH,L,TANS,U2G,SGN,  KPRESS
      COMMON /CFRONT/ ISAVE ,YSHK,PSISHK,FRACTN
      COMMON /CPTSLP/ XJUMP
      COMMON /CVPDUM/ VPTSLP(12)
      COMMON /CMOC/ ITER,P1SAVE,U1SAVE,RHO1SA,VQU1SA,Y1SAVE,JSET
      COMMON /CNTROP/ RHS2  ,RHS,RHS1
      COMMON /CMLIM/ ZM2LIM
      DIMENSION Y2(5,2),R2(5,2)
      LOGICAL DSHOCK,DUAL,PCONT,AXISYM
      COMMON /CSHFR/ IFIRST,HUGE
      COMMON /CSHENT/ RHS1HL(4),RHS2HL(4),SYHOLD(4),YENTHL(4),JSTJ,JJJJ
     1,PSI4EN(2),RHS1EN(2),RHS2EN(2)
      COMMON /CRESET/ XRESET
      COMMON/QSHKPT/SHKPRT
      LOGICAL SHKPRT

C         -JHI-  IS THE POINT BELOW AN UPSHOCK AT THE NEW X STATION
C         -JSHOCK- IS THE POINT BELOW AN UPSHOCK AT THE OLD X STATION
C         -JSHOCK- IS THE POINT ABOVE A DOWNSHOCK AT THE OLD X STATION
C               I.E., JSHOCK IS THE CLOSEST POINT WHICH HAS BEEN SHOCKED.
C         -DSHOCK- .EQ. .TRUE. REFERS TO A DOWN-SHOCK
C         -DSHOCK- .EQ. .FALSE. REFERS TO AN UPSHOCK


C*  TEMPORARIDY BYPASSS PROBLEM WITH PRINT CONTIOL
      XIPRT1=XRESET
      XIPRT2=XRESET
      XIPRT3=XRESET
      XIPRT4=XRESET
      IF (X.GT.XIPRT4) IDUM(6)=1
      JT=JTT
      II=1
      ITER=0
```

```
      EXPON=1./GAM1QG(JT)
      PSIREF=PSI(2,JT)-PSI(1,JT)
      IF (ISAVE.EQ.(-3)) IFIRST=-3
C*  ISHOCK.EQ.-3 IMLLIES A SHOCK HAS JUST BEEN STAETED FROM A CONSTANT P
C*  BOUNDARY.  THUS EVEN THIS IS THE FIRST TIME THROUGH *SHOCK* ALL
C*  QUANTITIES HAVE VEEN INITIALIZED I N*SHOCK2*

      NJ=NJJ(JT)
      LP2=L+2
      IF (JSHOCK.GT.0) GO TO 80

C*  A COALESCING SHOCK HAS JUST BEEN DETECTED, OR


C*  EXPECT TROUBLE WHEN JSHOCK = 1

      JSHOCK=-JSHOCK
      IFIRST=1
      VGUESS=VQU(JSHOCK,JT)

C*  **IFIRST=3** IMPLIES A SHOCK IS ORIGINATIONG FROM AN UPPER BOUNDARY
   80 ICH=0
      IF (DSHOCK) GO TO 85

C*  **  UPSHOCK
      JSH=JSHOCK+1
      JSH2=JSHOCK+2
      L=2
      SGN=1.0
      JKKK=JSHOCK-1
      JJ=JSHOCK
      K=1
      GO TO 90

C*  **  DOWNSHOCK
   85 L=1
      JSH=JSHOCK-1
      JSH2=JSHOCK-2
      K=2
  401 SGN =-1.0
      JKKK=JSHOCK+1
      JJ=JSHOCK-1
   90 LP2=L+2
      DELP=P2(L,JT)-P1(L,JT)
      DELVQU=VQU2(L,JT)-VQU1(L,JT)
      DELRHO=RHO2(L,JT)-RHO1(L,JT)
      DELU=U2(L,JT)-U1(L,JT)
      P2QP1=P2(L,JT)/P1(L,JT)

C*  ESTIMATE YSHK
      YSHK=YSHOCK+(X-XSHOCK(JT))*TANS1

      P1(L,JT)=    P(JSH,JT)
      U1(L,JT)=    U(JSH,JT)
      RHO1(L,JT)=RHO(JSH,JT)
      VQU1(L,JT)=VQU(JSH,JT)
```

```
      IF (IFIRST.EQ.0) GO TO 941
C*   FIRST TIME THROUGH
   94 U2G=.95*U1(L,JT)
      UCH(1,JT)=U(JSHOCK,JT)
      VQUCH(1,JT)=VQU(JSHOCK,JT)
      PTCH=PT(JSHOCK,JT)
      RCH(1,JT)=R(JSHOCK,JT)
      LP2=L
      IF (IFIRST.NE.1) VGUESS=SLOPE(K,JT)
      JJJJ=3
      OLDPTS=OLDPT(JSHOCK,JT)
      GO TO 935
C*   SUBSCRITT 1 OF HOLD BALUES REPEESENTS POINTS ON THE SHOCK
C*   SUBSCRIPT 2 OF HOLD QUANTITIES REPRESENTS FIRST GRID POINT ABOVE (BE
C*   A DOWN (UP) SHOCK
  941 JJJ=3
      UHLD(1)=U2(LP2,JT)
      VQUHLD(1)=VQU2(LP2,JT)
      PSIHLD(1)=PSHOCK
      UHLD(2)=U(JSHOCK,JT)
      VQUHLD(2)=VQU(JSHOCK,JT)
      PSIHLD(2)=PSI(JSHOCK,JT)
      PTHLD(2)=OLDPT(JSHOCK,JT)
      ZM2=U2(LP2,JT)*U2(LP2,JT)*(1.+VQU2(LP2,JT)*VQU2(LP2,JT))*RHO2(LP2,
     1JT)/(GAMMA(JT)*P2(LP2,JT))
      PTHLD(1)=(1.+ZM2*GAM1(JT)*.5)**EXPON*P2(LP2,JT)
      ZM2=U1(LP2,JT)*U1(LP2,JT)*(1.+VQU1(LP2,JT)*VQU1(LP2,JT))*
     1RHO1(LP2,JT)/(GAMMA(JT)*P1(LP2,JT))
      OLDPTS=(1.+ZM2*GAM1(JT)*.5)**EXPON*P1(LP2,JT)
  935 CALL ENTROP (1,JSH)
      RHS2HL(2)=RHS2
      RHS1HL(2)=RHS1
      SYHOLD(2)=PSI(JSH    ,JT)
      YENTHL(2)=Y(JSH    ,JT)
      CALL ENTROP (1,JSHOCK)
      RHS2HL(3)=RHS2
      RHS1HL(3)=RHS1
      SYHOLD(3)=PSI(JSHOCK,JT)
      YENTHL(3)=Y(JSHOCK,JT)
      IF (IFIRST.NE.0) GO TO 951
C*   CHECK TO BE SURE **YSHOCO**IS IN THE SAME INTERVAL AS **PSHOCK)*
      DSYHLD=(PSIHLD(2)-PSIHLD(1))*SGN
      IF (DSYHLD.GE.0.) PSIHLD(1)=PSIHLD(2)+.0001*SGN
      IF (JKKK.LT.JLHDY) JJJ=2
      IF (JKKK.GT.NJ) JJJ=2
      IF (JJJ.EQ.2) GO TO 410
      VQUHLD(3)=VQU(JKKK,JT)
      UHLD(3)=U(JKKK,JT)
      PSIHLD(3)=PSI(JKKK,JT)
      PTHLD(3)=OLDPT(JKKK,JT)
      CALL ENTROP (1,JKKK)
      RHS2HL(4)=RHS2
      RHS1HL(4)=RHS1
      SYHOLD(4)=PSI(JKKK   ,JT)
```

```
      YENTHL(4)=Y(JKKK   ,JT)
      JADD=1
      IF (JSH2.LE.0) JADD=0
      IF (JSH2.GE.NJ) JADD=0
      JJJJ=JJJ+JADD
      JSTJ=1
      IF (JADD.NE.0) GO TO 951
      JSTJ=2
      GO TO 955
  951 CALL ENTROP(1,JSH2)
      RHS2HL(1)=RHS2
      RHS1HL(1)=RHS1
      SYHOLD(1)=PSI(JSH2   ,JT)
      YENTHL(1)=Y(JSH2   ,JT)
  955 CONTINUE
      IF (X.LT.XIPRT2) GO TO 1413
                           CALL TABPRT (6HRHS1HL,RHS1HL,18,8)
      CALL TABPRT (3HPSI,PSI,40,10)
 1413 IF (IFIRST.NE.0) GO TO 944
  410 PSI4=PSHOCK*(1.-SGN*.001)
C*  PSI4 IS CHANFED ON A PERCENT BASIS--MAKE IT LARGE ENOUGH WHEN PSI IS
      IF (PSHOCK.LT.PSI(2,1)) PSI4=PSI4H
C)
C*  START OF ITERATION FOR **PSI4**  (S.L.VALUE AT WHICH CHAR. BEHIND SH
C*  HITS PREVIOUS X-LOCATION
  942 ICOUNT=0
      PSI4H=PSI4
      CALL LFIT   (PSIHLD,  UHLD,JJJ,PSI4,  UCH(1,JT),1,0)
      CALL LFIT   (PSIHLD,VQUHLD,JJJ,PSI4,VQUCH(1,JT),1,0)
      CALL LFIT (PSIHLD,PTHLD,JJJ,PSI4,PTCH,1,0)
      PSI4=PSI4H
  944 TS=TT(1,JT)-GAM1GG(JT)*UCH(1,JT)*UCH(1,JT)*(1.+VQUCH(1,JT)*
     1VQUCH(1,JT))*.5
      PCH(1,JT)=PTCH*(TS/TT(1,JT))**EXPON
      RHOCH(1,JT)=PCH(1,JT)/TS
      IF (X.GE.XIPRT4) CALL TABPRT (6HSHK CH,PCH,12,8)

C*  START OF ITERATION FOR **YSHK**
C*
      IF (X.GT.XIPRT2) WRITE (6,1411) YSHK,PSISHK,PSI(1,JT),JT
  945 ISHOCK=0
  946 R2(L,JT)=YSHK*RC+(1.-RC)

C*  USING ASSUMED VALUE OF **YSHK**, CALCULATE PROPERTIES IN FRONT OF SH
      ISAVE=ISHOCK+ICOUNT+ICH
      IF (IFIRST.LT.1) CALL FRONT (P1(L,JT),U1(L,JT),RHO1(L,JT),VQU1(L
     1,JT))
      ZM12=U1(L,JT)*U1(L,JT)*(1.+VQU1(L,JT)*VQU1(L,JT))*RHO1(L,JT)/
     1(GAMMA(JT)*P1(L,JT))
      CALL SONSHK (ZM12,VQU1(L,JT),VQU2MX,GAMMA(JT),SGN)
C*
C*  START OF ITERATION FOR **VQU2**  (USING CHAR.--COMPARE TO R-H VALUE)
   95 VQU2(L,JT)=VGUESS
      KPRESS=2
      GO TO 99
   98 KPRESS=1
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C*  USING ASSUMED VALUE FOR **VQU2**, CALCULATE RANKINE HUGONIOT JUMP CO
   99 CALL RH (X,JT)

      GO TO 190
C*  CALCULATE **PSISHK** IN CASE IT WASNT CALCULATED IN **FRONT**
  110 RAVG=(YSHOCK+YSHK)*RC*.5+(1.-RC)
      UAVG=(U1(L,JT)+U1(LP2,JT))*.5
      RHOAVG=(RHO1(L,JT)+RHO1(LP2,JT))*.5
      DPSIS=DX*RHOAVG*RAVG*((TANS+TANS1)-VQU1(L,JT)-VQU1(LP2,JT))*.5
     1*UAVG
      PSISHK=PSHOCK+DPSIS

  116 IF (.NOT.AXISYM) GO TO 117
C*  SHOCK WILL REFLECT FROM AXIS OF SYMMETRY NEST TIME--AVOID SUNGULSRIT
      IF (YSHK.LT.(.6*YSHOCK)) PSISHK=-ABS(PSISHK)
  117 IF (PSISHK.LE.PSI(1,JT)) GO TO 120
      IF (PSISHK.GE.PSI(NJ,JT)) GO TO 209

C         THE LAST  TIME THROUGH T                ISHOCK=-1  AND THE BAR
C         QUANTITIES ARE CORRECTED FOR THE SHOCK, BECAUSE BAR QUANTITIES

 1175 ISHOCK=-1
      IF (.NOT.DSHOCK) GO TO 210

C*        SHOCK IS A DOWNSHOCK

      JLOW=JSHOCK-1

  118 IF (PSI(JLOW,JT).LT.PSISHK) GO TO 122
      JLOW=JLOW-1
      GO TO 118

  120 JLOW=0
  122 JLOW=JLOW+1
      IF (JLOW.EQ.JSHOCK) GO TO 2005

      IF (JLOW.GE.(JSHOCK-1)) GO TO 130

C*  SHOCK HAS BROSSED MORE THAN ONE GRID POINT.  PRINT WARNING AND RESET
      IF(SHKPRT) WRITE(6,1425) YSHK,PSISHK,YBAR(JSHOCK-2,JT),
     1PSI(JSHOCK-2,JT),JLOW,JSHOCK,JT
      JLOW=JSHOCK-1
      DPSIER=(PSI(2,JT)-PSI(1,JT))*.001
      DYERR=(YBAR(2,JT)-YBAR(1,JT))*.001
      YSHK=YBAR(JSHOCK-2,JT)+DYERR
      PSISHK=PSI(JSHOCK-2,JT)+DPSIER

C*        SHOCK HAS CROSSED A GRID POINT SINCE LAST X-STEP
  130 J=JSHOCK-1
C         FIRST=1 IMPLIES A SHOCK IS ORIGINATING FROM AN UPPER BOUNDARY
C         FIRST TIME THROUGH (ONLY)

      IF (IFIRST.NE.1) GO TO 140
      PBAR(J,JT)=PBAR(J,JT)+DELP
      VQUBAR(J,JT)=VQUBAR(J,JT)+DELVQU
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      RHOBAR(J,JT)=RHOBAR(J,JT)+DELRHO
      GO TO 180

  140 RHOEST=RHO(J,JT)+DELRHO
      UEST=U(J,JT)+DELU
      VQUEST=VQU(J,JT)+DELVQU
      PEST=P(J,JT)*P2QP1
      DXQDSY=DX/(PSI(J+1,JT)-PSI(J,JT))
  145 DELTAP=PEST*ALOG(P(J+1,JT)/PEST)
  147 RHOU=RHOEST*UEST
      VQUY=VQUEST*R(J,JT)
      CALL ENTROP(1,J)
      DPX=(DXQDSY*RHOU*(RHOU*UEST*(VQU(J+1,JT)*R(J+1,JT)-VQUY)+VQUY*
     1DELTAP)-RHS)/(UEST*RHOU/(PEST*GAMMA(JT))-1.)
  149 PBAR(J,JT)=PEST*EXP(-DPX/PEST)
  150 DVQU=-DXQDSY*RHOU*R(J,JT)*(1.+VQUEST*VQUEST)*DELTAP-VQUEST*DPX
      VQUBAR(J,JT)=(DVQU+VQU(J,JT)*RHS1)/(RHOU*UEST)+VQUEST
      TS=TT(II,JT)*(PBAR(J,JT)/PT(J,JT))**GAM1QG(JT)
      RHOBAR(J,JT)=PBAR(J,JT)/TS
      GO TO 180

C*       SHOCK IS BETWEEN SAME TWO GRID POINTS AS IT WAS AT LAST X-STEP
 2005 IF (IFIRST.GT.0) GO TO 180
      J=JSHOCK-1
      PEST=P(J+1,JT)/P2QP1
      VQUEST=VQU(J+1,JT)-DELVQU
  160 DXQDSY=DX/(PSI(J+1,JT)-PSI(J,JT))
  165 DELTAP=P(J,JT)*ALOG(PEST/P(J,JT))
  167 RHOU=RHO(J,JT)*U(J,JT)
      VQUY=VQU(J,JT)*R(J,JT)
C*  IEER=99 MEANS CALL FINAL VALUES OF PROPRRTIES AT 2ND GRIF FOINT
      YPRE=Y1SAVE
      CALL ENTROP (1,J)
      CALL DXQM1 (P(J,JT),U(J,JT),RHO(J,JT),VQU(J,JT),R(J,JT),XQSYZM)
      DPX=XQSYZM*RHOU*(RHOU*U(J,JT)*(VQUEST*R(J+1,JT)-VQUY)+VQUY*
     1DELTAP)-RHS
  169 PBAR(J,JT)=P(J,JT)*EXP(-DPX/P(J,JT))
  170 DVQU=-DXQDSY*RHOU*R(J,JT)*(1.+VQU(J,JT)*VQU(J,JT))*DELTAP-
     1VQU(J,JT)*DPX
      VQUBAR(J,JT)=(DVQU+VQU(J,JT)*RHS1)/(RHOU*U(J,JT))+VQU(J,JT)
      TS=TT(II,JT)*(PBAR(J,JT)/PT(J,JT))**GAM1QG(JT)
      RHOBAR(J,JT)=PBAR(J,JT)/TS
      IF(.NOT.DSHOCK) GO TO 250
  180 CONTINUE
      IF (PSISHK.GT.PSI(1,JT)) GO TO 420

C*  SHOCK MUST REFLECT FROM A LOWER BOUNDARY, OR MUST CROSS A SLIPSTREAM
  185 U2G=.95*U2(L,JT)
      DELP=P2(L,JT)-P1(L,JT)
      DELVQU=VQU2(L,JT)-VQU1(L,JT)
      DELRHO=RHO2(L,JT)-RHO1(L,JT)
      DELU=U2(L,JT)-U1(L,JT)
      P2QP1=P2(L,JT)/P1(L,JT)
      ITER=0

C*  RESET IPR IN SSFD FOR PRINT
```

```
      IDUM(9)=IDUM(6)+1
      IF (DSHOCK) GO TO 195
      IF (DUAL.AND.JT.EQ.1) GO TO 198
  191 VGUESS=SLOPE(K,JT)
  192 L=1
      JSHOCK=NJJ(JT)
      J=NJJ(JT)
      JLOW=NJJ(JT)-1
      DSHOCK=.TRUE.
      GO TO 201

  195 GO TO (200,197),JT
C*  JT=2 MEANS SHOCK IS CROSSING A SLIP LINE
  197 JT=1
      XSHOCK(JT)=XSHOCK(2)
      XSHOCK(2)=HUGE
      ICRNER=-6
      NJ=NJJ(JT)
      GO TO 192

C*  UPSHOCK IS CROSSING A SLIP LINE
  198 JT=2
      XSHOCK(JT)=XSHOCK(1)
      XSHOCK(1)=HUGE
      ICRNER=-7
      NJ=NJJ(JT)
  200 L=2
      DSHOCK=.FALSE.
      IF (ICRNER.EQ.(-4)) GO TO 202
      JSHOCK=1
      J=1
      JLOW=-1
      JHI=2
      IF (ICRNER.EQ.(-7)) GO TO 201
CR* VGUESS IS SET NEGATIVE TO DIMINISH POSSIBILITY OF FINDING STRONG BRA
      VGUESS=-.02
      YBAR(1,JT)=0.

  201 TS=PBAR(J,JT)/RHOBAR(J,JT)
      UBAR(J,JT)=SQRT((TT(II,JT)-TS)*GAM2(JT)/(1.+VQUBAR(J,JT)*VQUBAR(J,
     1JT)))
      IFIRST=1
      IF (ICRNER.EQ.(-4)) GO TO 98
      VQU1(L,JT)=VQUBAR(J,JT)
      P1(L,JT)=PBAR(J,JT)
      U1(L,JT)=UBAR(J,JT)
      RHO1(L,JT)=RHOBAR(J,JT)
      IF (ICRNER.EQ.(-6).OR.ICRNER.EQ.(-7)) GO TO 945
      YSHOCK=YBAR(J,JT)
      PSHOCK=PSI(J,JT)
      K=2
      IF (PCONT(K,JT).AND.DSHOCK) GO TO 500
      IF (YSHK.LT.0.) YSHK=-YSHK
      PT(J,JT)=PT(J+1,JT)
      OLDPTS=PT(J,JT)
      IF (SHKPRT) WRITE(6,1431) PT(J,JT),PT(J+1,JT),J
```

```
 1431 FORMAT (2X,13HPT-AXIS-SHOCK,2F16.6,I8)
C*  APPROXIMATE TOTAL PRESSURE LOWW ACROSS INCOMING SHOCK

      IF (PSISHK.LT.0.) PSISHK=-PSISHK
      ISHOCK=-1
      ICRNER=4
      GO TO 946
C*  START AN UPHSOCK FROM A TRIPLE POINT
  202 JSHOCK=JLBDY
      JLOW=-JSHOCK
      JHI=JSHOCK
      J=IABS(JLOW)
      K=1
      P2(2,JT)=PBOUND(K,JT)
      SGN=1.
      VQU1(L,JT)=VQU2(L-1,JT)
      P1(L,JT)=P2(L-1,JT)
      U1(L,JT)=U2(L-1,JT)
      RHO1(L,JT)=RHO2(L-1,JT)
      XSHOCK(JT)=X
      YSHOCK=YSHK
      PSHOCK=PSISHK
      SYBDY=PSISHK
      GO TO 201

  209 IF (.NOT.DSHOCK) GO TO 215
C*  IF DSHOCK IS TRUE, SGICJ CANT CROSS UPPER BOUNDARY
      PSISHK=PSI(NJ,JT)*.99999
      GO TO 1175
C*       SHOCK IS AN UPSHOCK

  210 IF (PSISHK.GT.PSI(NJ,JT)) GO TO 215
  211 IF (PSI(JHI,JT).GT.PSISHK) GO TO 220
      JHI=JHI+1
      GO TO 211
  215 JHI=NJJ(JT)+1
  220 JHI=JHI-1
      IF (ICRNER.EQ.(-4)) GO TO 400
      IF (JHI.EQ.JLBDY) GO TO 400
      IF (JHI.EQ.JSHOCK) GO TO 230
C*       SHOCK HAS CROSSED A GRID POINT SINCE LAST X-STEP
      J=JHI
      PBAR(J,JT)=PBAR(J,JT)*P2QP1
      VQUBAR(J,JT)=VQUBAR(J,JT)+DELVQU
      RHOBAR(J,JT)=RHOBAR(J,JT)+DELRHO
  230 CONTINUE
C*       SHOCK IS BETWEEN SAME TWO GRID POINTS AS IT WAS AT LAST X-STEP
      J=JSHOCK+1
      VQUEST=VQU(J,JT)+DELVQU
      PEST=P(J,JT)*P2QP1
      J=JSHOCK
      GO TO 160
  250 IF (PSISHK.GE.PSI(NJ,JT)) GO TO  185
  400 JLOW=-JHI
      IF (ICRNER.NE.(-4)) GO TO 420
```

```
  190 IF (IFIRST.LT.1) GO TO 403
      TANS1=TANS
      LP2=L
      IF (ICRNER.EQ.(-6)) GO TO 420
      IF (DSHOCK) GO TO 413
 4005 PSHOCK=PSISHK
      YSHOCK=YSHK
      VGUESS=VQU2(L,JT)
      IF (ICRNER.EQ.(-7)) GO TO 500
      IF (.NOT.AXISYM) GO TO 420
      ZM2SQ=U2(L,JT)*U2(L,JT)*(1.+VQU2(L,JT)*VQU2(L,JT))*RHO2(L,JT)/
     1(GAMMA(JT)*P2(L,JT))
      IF (ZM2SQ.GT.1.04) GO TO 420
C*    CHECK TO BE SURE FLOW REMAINED SUPERSONIC AFTER SHOCK REFLECTION
      IF(.NOT.SHKPRT) GO TO 4010
      WRITE (6,1424) ZM2SQ
      WRITE (6,8) P2(L,JT),U2(L,JT),RHO2(L,JT),TS,TANS
 4010 CONTINUE
C*    REDEF FLOW FOR MACH NUMBER OF 1.02.  SAVE OF D VALUE OF VQU2
      TS=TT(II,JT)/(1.+(GAMMA(JT)-1.)*.5*1.04)
      U2(L,JT)=SQRT(1.04*GAMMA(JT)*TS/(1.+VQU2(L,JT)*VQU2(L,JT)))
      IFUDGE=1
      P2(L,JT)=P2(L,JT)*ZM2SQ/1.04
      RHO2(L,JT)=P2(L,JT)/TS
      TANS=TANS*ZM2SQ/1.04
      IF (SHKPRT) WRITE(6,8) P2(L,JT),U2(L,JT),RHO2(L,JT),TS,TANS
      GO TO 420

  403 GPAVG=GAMMA(JT)*(P2(L,JT)+PCH(1,JT))*.5
      VQUAVG=(VQU2(L,JT)+VQUCH(1,JT))*.5
      UAVG=(U2(L,JT)+UCH(1,JT))*.5
      RHOAVG=(RHO2(L,JT)+RHOCH(1,JT))*.5
      UAVG2=UAVG*UAVG
C*    BYPASS SINGULARITY AT AXIS OF SYMMETRY

      ZMAV2=RHOAVG*UAVG2*(1.+VQUAVG*VQUAVG)/GPAVG
      IF (ZMAV2.LT.1.01) ZMAV2=1.01
      CTNA=SQRT(ZMAV2-1.)
      TANA=1./CTNA
      VQUTAN=VQUAVG*TANA
      IF (ABS(VQUTAN).GT..999) VQUTAN=VQUTAN*.999/ABS(VQUTAN)
C*    CALC RCH FROM DY ALONG CHARACT*RISTIC
      RCH(1,JT)=YSHK-DX*(VQUAVG+SGN*TANA)/(1.-VQUTAN)
      IF (RCH(1,JT).LT..01) RCH(1,JT)=.01
      RAVG=(R2(L,JT)+RCH(1,JT))*.5

      VQRAVG=VQUAVG/RAVG
      IF (RCH(1,JT).GT.(4.*R2(L,JT))) VQRAVG=VQUCH(1,JT)/RCH(1,JT)
      IF (R2(L,JT).GT.(4.*RCH(1,JT))) VQRAVG=VQU2(L,JT)/R2(L,JT)
      VQU2P1=1.+VQUAVG*VQUAVG
      SQV2P1=SQRT(VQU2P1)
      CSOUND=SQRT(GPAVG/RHOAVG)
      DLQR=SQRT(DX*DX+(R2(L,JT)-RCH(1,JT))**2)*RC
      DAXIS=CSOUND*DLQR*VQRAVG/UAVG
C*    CORRECTION TO ALLOW REGULAE REFLECTION
      IF (YSHOCK.LT..10) DAXIS=DAXIS*YSHOCK*10.
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      IF (JSHOCK.LT.3) GO TO 650
 4035 CONTINUE
      PSI4EN(1)=PSI4
      PSI4EN(2)=PSISHK
      CALL LFIT (SYHOLD,RHS1HL(JSTJ),JJJJ,PSI4EN,RHS1EN,2,0)
      CALL LFIT (SYHOLD,RHS2HL(JSTJ),JJJJ,PSI4EN,RHS2EN,2,0)
      RHS1=(RHS1EN(1)+RHS1EN(2))*.5
      RHS2=(RHS2EN(1)+RHS2EN(2))*.5
      IF (X.LT.XIPRT3) GO TO 4036
      WRITE (6,1426) RHS1,RHS2
      CALL TABPRT (6HPSI4EN,PSI4EN,6,6)
 4036 CONTINUE
      VQU2(L,JT)=VQUCH(1,JT)-SGN*GPAVG*ALOG(P2(L,JT)/PCH(1,JT))/
     1(GAMMA(JT)*RHOAVG*UAVG2*TANA)-SGN*DAXIS
     2-SGN*CSOUND*(RHS1/(RHOAVG*UAVG2*UAVG*SQV2P1*TANA*DX)*(TANA+SGN*
     3VQUAVG)+RHS2/UAVG)*DLQR
      IF (X.LT.XIPRT4) GO TO 1113
      WRITE (6,8) DAXIS,VQRAVG,VGUESS,VQU2(L,JT)
      IF (ISAVE.GT.0.OR.ISHOCK.GT.0) GO TO 1113
      CALL TABPRT (4HHOLD,RHOHLD,30,6)
 1113 CONTINUE
      TOL=ABS((VQU2(L,JT)-VGUESS))
      IF (TOL.LT..001) GO TO 413
      IF (ISHOCK.GT.10) GO TO 408
      XJUMP=-.1
      CALL PTSLP (VGUESS,VQU2(L,JT),ISHOCK,VPTSLP,1.)
 1403 DIRSHK=(VGUESS-VQU1(L,JT))*SGN
C*  FOR DOWN-SHOCKS, THE GUESS ON VQU2 MUST BE LESS THAN VQU1
C*  FO  UP-SHOCKS, THE CONVERSW IS TRUE
      IF (DIRSHK.LT.0.) GO TO 404

C*  BE SURE FLOW BEHIND SHOCK IS SUPERSONIC
      DIRSHK=(VGUESS-VQU2MX)*SGN
      IF (DIRSHK.LT.0.) GO TO 95
      VGUESS=VQU2MX
      IF (VGUESS.EQ.VPTSLP(1)) GO TO 407
      GO TO 95
C*
  404 VGUESS=VQU1(L,JT)+SGN*.0001
      IF (VGUESS.EQ.VPTSLP) GO TO 407
      GO TO 95
  407 IF (SHKPRT) WRITE(6,1419)
  408 IF (SHKPRT) WRITE(6,1420) VQU1(L,JT),VQU2(L,JT),VGUESS,P2(L,JT)
C*
C*  END OF ITERATION FOR **VQU2**
  413 VQU2(L,JT)=VGUESS
      YSHKC=YSHOCK+(X-XSHOCK(JT))*(TANS+TANS1)*.5
      ERROR=YSHK-YSHKC
      IF (X.GT.XIPRT2) WRITE (6,1099) YSHK,YSHKC,TANS
      IF (ABS(ERROR).LT..001) GO TO 417
      IF (ICOUNT.GT.10) GO TO 416
      XJUMP=SGN*(Y(JSHOCK,JT)-Y(JSH,JT))*.5
      CALL PTSLP (YSHK,YSHKC,ICOUNT,VPTSLP(9),1.)
      GO TO 945
  416 IF (SHKPRT) WRITE (6,1418) YSHK,YSHKC,ERROR
C*
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```
C*   END OF ITERATION FOR **YSHK**
C*   DONT DO THE CHAR ITERATION THE FIRST TIME THROUGH
  417 Y2(L,JT)=YSHKC
      YSHK=YSHKC
      IF (IFIRST.NE.0) GO TO 110
  418 DPSI5=PSHOCK-PSISHK

C*   CALC DPSI ALONG PREVIOUS X-STATION
      DPSI1=.5*     RHOCH(1,JT)*UCH(1,JT)*(RCH(1,JT)*RCH(1,JT)-YSHK*YSHK)
      PSI4C=PSHOCK+DPSI1
      ERROR=ABS((PSI4-PSI4C)/PSIREF)
      IF (X.GE.XIPRT4) WRITE (6,7) PSI4,PSI4C,PSHOCK,PSISHK,PSI(JSHOCK,J
     1T)
      IF (ERROR.LT..005) GO TO 420
      IF (ICH.GT.5) GO TO 419
      IF (PSI4C.LT.0.) GO TO 4186
      XJUMP=.3
      CALL PTSLP (PSI4,PSI4C,ICH,VPTSLP(5),1.)
      IF (PSI4.LT.PSI(JLBDY,JT)) PSI4=PSI(JLBDY,JT)
      DPSICK=(PSHOCK-PSI4)*SGN
      IF (PSI4.GT.PSI(NJ,JT)) PSI4=PSI(NJ,JT)
      IF (DPSICK.LT.0.) PSI4=PSHOCK
      IF (PSI4.EQ.VPTSLP(5)) GO TO 4195
      GO TO 942

C*   DONT TRY TO CONTINUE ITERATION WHEN SHOCK IS SO NEAR AXIS--PSI ITERA
C*   TRIVIAL THEN ANYWAY
 4186 ICH=2
  419 IF (SHKPRT) WRITE(6,1421) PSI4,PSI4C,PSHOCK,PSI(JSHOCK,JT)
C*
C*   END OF ITERATION FOR **PSI4**
C*
 4195 IF (ICH.GT.1) GO TO 4198
      PSI4=PSHOCK*(1.-SGN*.05)
      GO TO 942
 4198 IF (SHKPRT) WRITE(6,1423)
  420 IF (ISHOCK.NE.(-1)) GO TO 116
      JTEST=IABS(JLOW)
      IF (JTEST.EQ.JSHOCK) GO TO 460
C*   IF SHOCK CROSSES A GRID POINT, THE Y-PSI CURVE IS CHANGED.
      FRACTN=(PSI(JTEST,JT)-PSISHK)/(PSHOCK-PSISHK)
      IF (FRACTN.LT.0.) FRACTN=0.
      DELVQU=VQU2(L,JT)-VQU1(L,JT)
      YBAR(JTEST,JT)=Y(JTEST,JT)+DX*VQU(JTEST,JT) +DX*DELVQU*FRACTN
      IF(.NOT.SHKPRT) GO TO 460
      WRITE (6,7) YBAR(JTEST,JT),Y(JTEST,JT),DELVQU,DPSI5,PSISHK,YSHK,
     1 FRACTN,JTEST
  460 IF (ICRNER.EQ.(-4)) GO TO 500
      CALL MDISC
      IF (ICRNER.EQ.(-4)) GO TO  185
  500 CONTINUE
  600 CONTINUE
      IFIRST=0
      IF (JLOW.EQ.(-1).AND.ICRNER.NE.4) GO TO 610
      RETURN
  610 ITER=99
```

```
      JSET=2
      Y1SAVE=Y(2,1)
      P1SAVE=P1(L,JT)
      U1SAVE=U1(L,JT)
      RHO1SA=RHO1(L,JT)
      VQU1SA=VQU1(L,JT)
C*****CALL FRONT (P1SAVE,U1SAVE,RHO1SA,VQU1SA)
      RETURN
  650 IF (DSHOCK) GO TO 655
      GO TO 4035
  655 IF  (PCH(1,JT).LT.P2(L,JT)) GO TO 4035
      PCH(1,JT)=P2(LP2,JT)
      GO TO 4035

    7 FORMAT (1X,7F12.6,I8)
    8 FORMAT (1X,7F16.8)
 1099 FORMAT (1X,15HSUBROUTINE SHK-,15HYSHK,YSHKC,TANS,3F14.7)
 1411 FORMAT (1X,21HYSHK,PSISHK,PSI(1),JT,3F14.7,I5)
 1418 FORMAT (1X,26HITERATION FAILURE IN SHOCK,3F14.7)
 1419 FORMAT (1X,48HNO SOLN IS AVAILAVLE IN CHARACTERISTIC ITERATION    )
 1420 FORMAT (1X,48HFAILURE OF CHARACTERISTIC ITERATION--SHOCK SUB.    ,/
     1,19HVQU1,VQU2,VGUESS,P2,5F14.7)
 1421 FORMAT (1X,47HCHARACTERISTIC ITERATION IN **SHOCK** FAILED    ,29HP
     1SI4,PSI4C,PSHOCK,PSI(JSHOCK),4F12.6)
 1423 FORMAT (1X,24HPSI4 IS LESS THAN PSHOCK)
 1424 FORMAT (1X,61HFLOW WENT SUBSONIC WHEN SHOCK REFLECTED FROM AXIS OF
     1 SYMMETRY,F16.6)
 1425 FORMAT (10X,49HSHOCK HAS CROSSED TWO GRID POINTS--HAS BEEN RESET,
     1/,1X,20HYSHK,PSISHK,YBAR,PSI,4F12.6,14HJLOW,JSHOCK,JT,3I5,/)
 1426 FORMAT (10X,13HENTROP--SHOCK,2F14.6)
      END
```

```
*DECK SHOCK2
      SUBROUTINE SHOCK2(X)
*SHOCK2          SHOCK CALCULATIONS FOR STEP 2  -SHOCK2-
      COMMON /CCRNER/ NPTSM1,KDUM,ICRNER,XCRNER
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),           R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JTT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON /CINPUT/ PT(40,2),DUMIN(648)
      COMMON /CSHK/ TANS1,DSHOCK,PSHOCK,DELP,DELVQU,JLOW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON/CINIT/NJJ(2),DUMMY(7),IPRINT,DUM(5)
      COMMON /CXPR/ XIPRT1,XIPRT2,XIPRT3,XIPRT4
      COMMON /COLDPT/ OLDPT(23,2),OLDPTS(2)
      COMMON /CSHMN/ ZM1,ZM2
      COMMON/QSHKPT/ SHKPRT
      LOGICAL SHKPRT
      COMMON /CFRONT/ ISHOCK,YSHK,PSISHK,FRACTN
      COMMON /CRH/ JSH,L,TANS,U2G,SGN,KPRESS
      COMMON /CSHK2/ IFIRST,II
      COMMON /CXDISC/ XMDISC,XSAVE,IDISC,MDISCC
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,ENDJOB
     1 ,SOLID(2,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CMOC/ ITER,P1SAVE,U1SAVE,RHO1SA,VQU1SA,Y1SAVE,JSET
      COMMON /CSHKPT/ SHKPT(23,2)
      COMMON /CRESET/ XRESET(2)
      LOGICAL PCONT,DSHOCK,IPRINT
      DATA JFUDGE/0/

C* - TURN OFF PRINT
      IF (X.GT.XRESET(2)) XRESET(1)=100.
C         TANS1    -S THE TANGENT OF THE SHOCK ANGLE AT THE OLD X-STATION

      JT=JTT
      IF (.NOT.DSHOCK) JFUDGE=JFUDGE+1
      ILIM=0
      L=1
      EXPON=1./GAM1QG(JT)
      IF (ICRNER.EQ.(-7)) GO TO 820
      IF (ICRNER.EQ.(-6)) GO TO 800
      IF (ICRNER.EQ.(-3)) GO TO 60
      IF (ICRNER.EQ.(-1)) GO TO 65
   49 JSH=JLOW-1
      ISHOCK=0
      IF (DSHOCK) GO TO 90
      L=2
      JSTOR1=-JLOW
      JSTOR2=-JLOW+1
      IF (IFIRST.NE.0) GO TO 50
C*   IFIRST=0  IMPLIES THIS IS THE FIRST TIME THOUUTH SINCE A SHOCK HAS C
C*   FROM DOWN TO UP
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```
      YSHK=YSHOCK
      PSISHK=PSHOCK
      IFIRST=1
      TANS=TANS1
      IF (ICRNER.EQ.(-4)) L=1
      DELP=P2(L,JT)-P1(L,JT)
      DELVQU=VQU2(L,JT)-VQU1(L,JT)
      P2OP1=P2(L,JT)/P1(L,JT)
      L=2
      J=JSHOCK+1
      IF (ICRNER.EQ.(-4)) GO TO 500
C*  A SHOCK IS FEFLECTING FROM THE AXIS OF SYMMETRY
      ICRNER=-8
      VQUJS=VQU(2,1)
      PJS=P(2,1)
      JFUDGE=0

C*  APPROXIMATE PRESSURE LOSS ACROSS INCOMING PART OF SHOCK
      SHKPT(1,1)=OLDPT(1,1)-OLDPT(2,1)+SHKPT(1,1)
      IF(SHKPRT)
     1CALL TABPRT (5HSHKPT,SHKPT,46,10)
      GO TO 830
   50 JSH=-JLOW+1
      GO TO 115

C*  START OF SHOCK TO CONSTANT PRESSURE BOUNDARY
   60 KPRESS=1
      GO TO 70
C*  STATI OF SHOCK TO SOLID WALL
   65 KPRESS=2
   70 K=2
      VQU2(L,JT)=SLOPE(K,JT)
      P2(L,JT)=PBOUND(K,JT)
      J=-JSHOCK
      JLOW=J
      SGN=-1.
      GO TO 92

   90 JSTOR1=JLOW
      JSTOR2=JSHOCK
      IF (IFIRST.NE.2) GO TO 115
      YSHK=YSHOCK
      PSISHK=PSHOCK
      K=2
      IF (PCONT(K,JT)) GO TO 600
      GO TO 500

  115 PJL=P(JSTOR1,JT)
      VQUJL=VQU(JSTOR1,JT)
      PJS=P(JSTOR2,JT)
      VQUJS=VQU(JSTOR2,JT)

      IF (JSHOCK.GT.0) GO TO 122
C*        ADJUST FLOW AT WALL FOR SHARP CORNER
      JSHOCK=-JSHOCK
      J=NJJ(JT)
```

```
      VQU2(L,JT)=SLOPE(K,JT)
   92 IFIRST=-2
      U2(L,JT)=.9*U(J,JT)
      YSHK=Y(J,JT)
      PSISHK=PSI(J,JT)
      RHO1(L,JT)=RHO(J,JT)
      VQU1(L,JT)=VQU(J,JT)
      U1(L,JT)=U(J,JT)
      P1(L,JT)=P(J,JT)
   93 VGUESS=VQU2(L,JT)
      U2G=U2(L,JT)
   95 VQU2(L,JT)=VGUESS
      CALL RH (X,JT)
  110 SLOPE(K,JT)=VQU2(L,JT)
      IF (IFIRST.EQ.(-2)) GO TO 850
      IF (IFIRST.NE.1) GO TO 112
      TANS1=TANS
  112 DELY=(X-XSHOCK(JT))*(TANS+TANS1)*.5
      YSHK=YSHOCK+DELY
      CALL LSPFIT (Y(1,JT),PSI(1,JT),NJJ(JT),YSHK,PSISHK,1,0)
      DPSI5=PSISHK-PSHOCK
  122 DELP=P2(L,JT)-P1(L,JT)
      DELVQU=VQU2(L,JT)-VQU1(L,JT)
      P2QP1=P2(L,JT)/P1(L,JT)

C         -JHI-  IS THE POINT BELOW AN UPSHOCK AT THE NEW X STATION
C         -JSHOCK- IS THE POINT BELOW AN UPSHOCK AT THE OLD X STATION
C         -JSHOCK- IS THE POINT ABOVE A DOWNSHOCK AT THE OLD X STATION
C                I.E., JSHOCK IS THE CLOSEST POINT WHICH HAS BEEN SHOCKED.

      IF (.NOT.DSHOCK) GO TO 300
      IF (JLOW.EQ. JSHOCK) GO TO 2025

C*        SHOCK HAS CROSSED A GRID POINT SINCE LAST X-STEP

      J=JLOW
      DXQDSY=DX/(PSI(J  ,JT)-PSI(J-1,JT))
      RHOU=RHOBAR(J,JT)*UBAR(J,JT)
      VQUY=VQUBAR(J,JT)*RBAR(J,JT)
      AP2QP1=ALOG(P2QP1)
      DPX=DXQDSY*RHOU*(RHOU*UBAR(J,JT)*DELVQU*RBAR(J-1,JT)+VQUY*
     1AP2QP1   *PBAR(J,JT))/(RHOU*UBAR(J,JT)/(PBAR(J,JT)*GAMMA(JT))-1.)
      P(J,JT)=PJL*SQRT(P2QP1)*EXP(DPX*.5/PBAR(J,JT))
      VQU(J,JT)=VQUJL+.5*(DELVQU+(VQUBAR(J,JT)*DPX+RBAR(J,JT)*RHOU*(1.+
     1VQUBAR(J,JT)*VQUBAR(J,JT))*PBAR(J,JT)*AP2QP1*DXQDSY)/(RHOU
     2*UBAR(J,JT)))
      Y(J,JT)=Y(J,JT)-DX*.5*(1.-FRACTN)*DELVQU
      GO TO 500

 2025 IF (IFIRST.GE.1) GO TO 500

C*        SHOCK IS BETWEEN SAME TWO GRID POINTS AS IT WAS AT LAST X-STEP
C*   THE FOIRST TIME THROUGH AN UPSHOCK, AFTER A DOWN SHOCK,  IFIRST=1

      IF (JSHOCK.EQ.NJJ(JT)) GO TO 500
C         IF JSHOCK .EQ. NJ TOO NOT CORRECT P,ETC VALUES,  BECAUSE IF A S
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C(  EXISTS, THE OLD VALUES OF P,ETC WILL STILL BE NEEDED IN BNDRY

C         SGNN=1.  APPLIES TO A DOWN-SHOCK.
C         SGNN=-1. APPLIES TO AN UP-SHOCK

      J=JSHOCK
  290 SGNN=1.
      GO TO 330

  300 IF (JLOW.EQ.(-1)) GO TO 830
      IF ((-JLOW).EQ.JSHOCK) GO TO 320
C         CORRECT DEPENDENT VARIABLES TO INCLUDE JUMP CONDITIONS ACROSS
C         THE SHOCK.
      J=-JLOW
      P(J,JT)=PJL*SQRT(P2QP1)
      IF( .NOT.SHKPRT ) GO TO 1429
      IF (.NOT.DSHOCK) WRITE (6,1428) J,PJL,P(J,JT),PBAR(J,JT),
     1PBAR(J-1,JT)
 1428 FORMAT (I7,4F14.7)
 1429 VQU(J,JT)= VQUJL+.5*DELVQU
      Y(J,JT)=Y(J,JT)-DX*.5*(1.-FRACTN)*DELVQU

  320 J=-JLOW+1
      SGNN=-1.
  330 DXQDSY=DX/(PSI(J  ,JT)-PSI(J-1,JT))
      RHOU=RHOBAR(J,JT)*UBAR(J,JT)
      VQUY=VQUBAR(J,JT)*RBAR(J,JT)
      IF (JT.EQ.1.AND.J.EQ.2.AND.DSHOCK) GO TO 535
      IF (JFUDGE.LE.4.AND..NOT.DSHOCK) GO TO 831
      AP2QP1=ALOG(P2QP1)
      DPX=DXQDSY*RHOU*(RHOU*UBAR(J,JT)*DELVQU*RBAR(J-1,JT)+VQUY*PBAR(J,
     1JT)*AP2QP1)/(UBAR(J,JT)*RHOU/(PBAR(J,JT)*GAMMA(JT))-1.)
      P(J,JT)=PJS*EXP(.5*SGNN*DPX/PBAR(J,JT))
      VQU(J,JT)=VQUJS+.5*SGNN*(VQUBAR(J,JT)*DPX+RBAR(J,JT)*RHOU*(1.+
     1VQUBAR(J,JT)*VQUBAR(J,JT))*PBAR(J,JT)*AP2QP1*DXQDSY)/(RHOU*
     1UBAR(J,JT))
  333 TS=TT(II,JT)*(P(J,JT)/PT(J,JT))**GAM1QG(JT)
      RHO(J,JT)=P(J,JT)/TS

C         L=1,2  IS THE CURRENT VALUES OF THE SHOCK CONDITIONS.
C         LP2=L+2  IS THE PREVIOUS VALUES OF THE SHOCK CONDITIONS.

  500 LP2=L+2
      P2(LP2,JT)=P2(L,JT)
      P1(LP2,JT)=P1(L,JT)
      VQU2(LP2,JT)=VQU2(L,JT)
      VQU1(LP2,JT)=VQU1(L,JT)
      U2(LP2,JT)=U2(L,JT)
      U1(LP2,JT)=U1(L,JT)
      RHO2(LP2,JT)=RHO2(L,JT)
      RHO1(LP2,JT)=RHO1(L,JT)

C*  CALCULATE SHOCK INFORMATRION
  530   ZM1=U1(L,JT)*SQRT((1.+VQU1(L,JT)*VQU1(L,JT))*RHO1(L,JT)
     1/(GAMMA(JT)*P1(L,JT)))
        ZM2=U2(L,JT)*SQRT((1.+VQU2(L,JT)*VQU2(L,JT))*RHO2(L,JT)/
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     1(GAMMA(JT)*P2(L,JT)))
      ZMSINS=(ZM1*(TANS-VQU1(L,JT)))**2/((1.+TANS*TANS)*(1.+VQU1(L,JT)
     1*VQU1(L,JT)))
      IF (ZMSINS.LT.1.0001) ZMSINS=1.0001
      GP1I=2./(GAMMA(JT)+1.)
      OLDPTS(2)=OLDPTS(1)*(1.+GP1I*GAMMA(JT)*(ZMSINS-1.))**(-1./(GAMMA
     1(JT)-1.))*(1.-GP1I*(1.-1./ZMSINS))**(-1./GAM1QG(JT))
      IF (IPRINT)
     1WRITE (6,9) X,YSHK,P2(L,JT),P1(L,JT),ZM2,ZM1
      SHKTOL=.001
      IF (ZM2.GT.(ZM1-SHKTOL)) GO TO 640
      IF (ZM2.LT.1.) GO TO 750
  533 J=IABS(JLOW)

C*   SHOCK HAS CROSSED A GRID POINT--CORRECT TOTAL PEESSURE
      IF (JSHOCK.EQ.J.AND.ICRNER.GT.(-4)) GO TO 550
C*   STORE CHANGE IN TOTAL PRESSURE ACROSS SHOCK FOR USE IN --ENTRIP--
      PTSHKN=PT(J,JT)-OLDPTS(1)+OLDPTS(2)
      SHKPT(J,JT)=SHKPT(J,JT)+PT(J,JT)-PTSHKN

      IF (ICKPR.NE.3) GO TO 701
      IF (ZM2.GT.1.02) GO TO 701
C*   ICKPR=3  IS THE FIRST TIME THROUGH AFEER RFLECTION OF SHOCK
      Q12=U1(LP2,JT)*U1(LP2,JT)*(1.+VQU1(LP2,JT)*VQU1(LP2,JT))
      VQU1(LP2,JT)=VQU(2,1)
      U1(LP2,JT)=SQRT(Q12/(1.+VQU1(LP2,JT)*VQU1(LP2,JT)))
      P1(LP2,JT)=P(2,1)
  701 CONTINUE

      ICKPR=0
      PT(J,JT)=PTSHKN

      TS=TT(II,JT)*(P(J,JT)/PT(J,JT))**GAM1QG(JT)
      RHO(J,JT)=P(J,JT)/TS
      IF (IFIRST.EQ.10) GO TO 620
      IF (ICRNER.EQ.(-7).OR.ICRNER.EQ.(-6)) GO TO 810
  550 IFIRST=0
      IF (JLOW.LT.0) IFIRST=2
C*   AXIS OF SYMMETRY CORRECTION WHEN SHOKK IS NEAR AXIS
      IF (Y(JLBDY,JT).GT..0001) GO TO 560
      IF (JLOW.GT.2.OR.JLOW.LT.(-1)) GO TO 560
      IF (JLOW.EQ.2) SGK=1./(P2OP1**3)
      IF (JLOW.EQ.(-1)) SGK=P2OP1**3
      P(1,JT)=(P(2,JT)**4*SGK/P(3,JT))**.333333333
  560 YSHOCK=YSHK
      PSHOCK=PSISHK
      IF (ICRNER.EQ.(-3)) ISHOCK=-3
      TANS1=TANS
      JSHOCK=IABS(JLOW)
      XSHOCK(JT)=X
      Y2(L,JT)=YSHK
      R2(L,JT)=Y2(L,JT)*RC+(1.-RC)
      IF (.NOT.DSHOCK.OR.JT.EQ.2) GO TO 700
      DELM=(ZM1-ZM2)/(ZM2-1.)
C*   STORE OLD VALUES OF PROPERTIES FOR USE IN RESTART
      IF (DELM.GT..5) XSAVE=X
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      GO TO 700

C*  USE LINEAR INTERPOLATION ON -LN P- TO GET NEW P
  535 JM1=J-1
  536 DXQDSY=DX/(PSI(J,JT)-PSI(JM1,JT))
      DELTAP=PBAR(J,JT)*ALOG(PBAR(J,JT)/PBAR(JM1,JT))
      DPX=(DXQDSY*RHOU*(RHOU*UBAR(J,JT)*(VQUY-VQUBAR(JM1,JT)*RBAR(JM1,
     1JT))+VQUY*DELTAP)     )/(UBAR(J,JT)*RHOU/(PBAR(J,JT)*GAMMA(JT))-1.)
      IF (JM1.GT.J) GO TO 537
      DXDSYM=DXQDSY
      DELPM=DELTAP
      DPXM=DPX
      JM1=J+1
      GO TO 536
  537 P(J,JT)=P(J,JT)*EXP(.5*(DPXM-DPX)/PBAR(J,JT))
      VQU(J,JT)=VQU(J,JT)+(VQUBAR(J,JT)*(DPXM-DPX)+RBAR(J,JT)*RHOU*(1.+
     1VQUBAR(J,JT)*VQUBAR(J,JT))*(DELPM*DXDSYM-DELTAP*DXQDSY))/(2.*
     2RHOU*UBAR(J,JT))
      GO TO 333
  600 IFIRST=10
C*  SEE IF JLOW WAS ALL RIFHT
      JSHOCK=1
      JLOW=NJJ(JT)
      L=2
      GO TO 530

  620 VQUT=VQU(J,JT)+VQU2(L,JT)-VQU1(L,JT)
      IF (SHKPRT) WRITE(6,6) J,JT,VQUT,P(J,JT),PT(J,JT)
      GP1GM1=SQRT((GAMMA(JT)+1.)/(GAMMA(JT)-1.))

C*  SHOC8 HAS HIT CONSTANT PRESSURE BOUNDARY--TURN FLOW THROUGH XXPANSIO
      ZMSQ=ZM2*ZM2
  630 ZM2M12=SQRT(ZMSQ-1.)
      PM=GP1GM1*ATAN(ZM2M12/GP1GM1)-ATAN(ZM2M12)
      IF (IFIRST.EQ.11) GO TO 635
      IFIRST=11
      PM2=PM
C*  CALCULATE MACH NUMBER AFTER EXPANSION
      ZMSQ=((PT(J,JT)/P(J,JT))**((GAMMA(JT)-1.)/GAMMA(JT))-1.)*2./(
     1GAMMA(JT)-1.)
      GO TO 630
  635 VQUT=ATAN(VQUT)
      VQUT=VQUT+PM-PM2
      VQUBAR(J,JT)=SIN(VQUT)/COS(VQUT)
      IF(SHKPRT)
     1WRITE (6,5) VQUBAR(J,JT),VQU(J,JT),VQUT
    5 FORMAT (1X,3F16.6)
    6 FORMAT (1X,2I5,2X,9HVQUT,P,PT,3F16.6)
    7 FORMAT (1X,33HEXPANSION TO CONSTANT PRESS BNDRY,5HZM,PM,4F16.6)

C*       SHOCK HAS ENDED.  RE-INITIALIZE PARAMETERS IN CASE NEW SHOCK AP
  640 JLOW=0
      XSHOCK(JT)=1.E8
      JSHOCK=NJJ(JT)
      IFIRST=1
  700 RETURN
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  750 IF (ICRNER.NE.(-4)) GO TO 760
C*  MDISC HAS BEEN INSERTED TOO LATE.  MOVE DISC UPSTREAM AND RESTART
      IDISC=2
      RETURN

C*  MAINTAIN SUPERSONIC FLOW BEHIND SHOCK
  760 CALL        RESETM  (EXPON,LP2,1)
      GO TO 533

C*  A SHOCK IS CROSSING A SLIP LINE--NO CORREXTIONS ARE NEEDED
  800 JT=1
      J=NJJ(JT)
      GO TO 500

  810 PT(1,2)=PTSHKN
      SHKPT(1,2)=SHKPT(J,JT)
      J=NJJ(1)
      PT(J,1)=PT(1,2)
      SHKPT(J,1)=SHKPT(1,2)
      GO TO 550

  820 L=2
      J=1
      GO TO 500

C*  CHECK FOR REFLECTION OKF SHOCK
  830 J=-JLOW+1
      IF (IFIRST.NE.1) GO TO 320
  831 P(J,JT)=P(J+1,JT)
      VQU(J,JT)=VQU(J+1,JT)*SQRT(R(J,JT)/R(J+1,JT))
      IF (JFUDGE.NE.0) GO TO 333

      P(J,JT)=P(J+1,JT)*PT(J,JT)/PT(J+1,JT)
      V1L=VQU1(L,JT)
      VQU1(L,JT)=(VQU1(L,JT)+3.*VQU(J,JT))*.25
      U1(L,JT)=SQRT(U1(L,JT)*U1(L,JT)+V1L*V1L-VQU1(L,JT)*VQU1(L,JT))
      JSHOCK=0
      ICKPR=3
      GO TO 333

C*  SHOCK TO UPPER BOUNDARY--CONSTANT PRESSURE OR SOLID WALL
  850 P(J,JT)=P(J,JT)+P2(L,JT)-P1(L,JT)
      VQU(J,JT)=VQU(J,JT)+VQU2(L,JT)-VQU1(L,JT)
      RHO(J,JT)=RHO(J,JT)+RHO2(L,JT)-RHO1(L,JT)
      U(J,JT)=U(J,JT)+U2(L,JT)-U1(L,JT)
      VQUBAR(J,JT)=VQU(J,JT)
      RHOBAR(J,JT)=RHO(J,JT)
      UBAR(J,JT)=U(J,JT)
      PBAR(J,JT)=P(J,JT)

C*  SET **JSHOCK** TO MAKE SURE TOTAL PRESSURE IS ADJUSTED
      JSHOCK=JLOW+1
      GO TO 500

    8 FORMAT (5F16.8)
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    9 FORMAT (1X,8HXSHOCK =,F12.6,3X,8HYSHOCK =,F12.6,3X,4HP2 =,F12.6,
     1 3X,4HP1 =,F12.6,3X,7HMACH2 =,F8.3,3X,7HMACH1 =,F8.3)
      END
*DECK SONSHK
      SUBROUTINE SONSHK(ZM12,VQU1,THETMX,GAMMA,SGN)
*SONSHK       CALCULATES SONIC TURNING ANGLE THROUGH SHOCK

      COMMON /CSHMN/ ZM1,ZM2

C*  IF MACH NUMBER BEHIND SHOCK AT LAST X-STATION WAS SUFFICIENTLY LARGE
C*  DO CALUCLATION FOR MAX TURNING

C*  MUST PRESET VQU2MX
      THETMX=100.*SGN
      IF (ZM2.GT.1.2) RETURN

C*  --THETA-- IS THE MAXIMUM TURNING ANGLE SO THAT FLOW BEHIND SHOCK REM

      GP1=GAMMA+1.
C*  FROM -NACA 1135, PG 12, EQ 167- --SHOCK ANGLE SOR SONIC FLOW--
      SIN2B=(GP1*ZM12-(3.-GAMMA)+SQRT(GP1*(GP1*ZM12*ZM12-2.*(3.-GAMMA)
     1*ZM12+(GAMMA+9.))))/(4.*GAMMA*ZM12)

C*  FROM L AND R, PG 88, EQ 47---FOR SONIC FLOW BEHIND SHOCK--
      SIN2BT=(1.+ (GAMMA-1.)*.5*ZM12*SIN2B)/(GAMMA*ZM12*SIN2B-(GAMMA-1.
     1)*.5)
      SINB=SQRT(SIN2B)
      SINBT=SQRT(SIN2BT)

C*  SHOCK ANBLE-- BETA
      BETA=ATAN(SINB/SQRT(1.-SIN2B))
      BMTHET=ATAN(SINBT/SQRT(1.-SIN2BT))

      THETA=BETA-BMTHET
      TH1=ATAN(VQU1)
      THETMX=TH1+SGN*THETA
      THETMX=SIN(THETMX)/COS(THETMX)

      RETURN
      END
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*DECK SSFDM
      SUBROUTINE SSFDM
*SSFDM     SUPERSONIC FINITE DIFFERENCE  **SSFD**
      COMMON /CLOGIC/ PCONT(2,2),DUAL,SLIP,AXISYM,SSTRM,BARPRT,ENDJOB
     1  ,SOLID(2,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1OG(2)
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CSHK/ TANS1,DSHOCK,PSISHK,DUMSH1,DUMSH2,JLW,JSHOCK
     1,XSHOCK(2),YSHOCK
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4  ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2),TT(1,2)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TDUM,DPSI(2)
      COMMON /CINPUT/ PT(40,2),DU(1,2),PRESS(40,2),YIN(40,2),ZM(40,2)
     1 ,THETA(40,2),TANTH(40,2)
     2   ,XLOW(20,2),YLOW(20,2),XUP(20,2),YUP(20,2),NSTRM(2),NPTSL(2)
     3  ,NPTSU(2),PUP(20,2),PLOW(20,2)
      COMMON /CSTOR2/ DX1,SGN,I1,IEND(2,2)
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CCRNER/ NPTSM1,K,ICRNER,XCRNER
      COMMON /CATAN3/ DANG
      COMMON /CLSPF/ INTERV
      COMMON /CPI/ PI,TWOPI
     .COMMON /CNTROP/ EXPOFS,RHS,RHS1
      COMMON /CBITS/ BITS,BLANK
      COMMON /CXDISC/ XMDISC,XSAVE, IDISC,MDISCC
      COMMON /CJLBYS/ JLBDYS(2)
      COMMON / TKEIN/ DUMTKE(40),NTKE ,DUMRL(21),XPRINT(100),TIJET
      LOGICAL AXISYM,DUAL,SSTRM,PCONT,BARPRT,ENDJOB,SOLID
      LOGICAL DSHOCK,SLIP,MDISCC
      DATA KBDRYL,KBDRYU /2*3/,JPRINT /2/
      NAMELIST /OUTPUT/ NSTRM,NPTSU,NPTSL,ICRNER,XCRNER,PCONT,XL,SOLID

C* VARIABLES WHICH ARE DIMENSIONED 2X2 REFER TO LOWER AND UPPER BOUNDARI
C* OF LOWER AND UPPER STREAMS RESPECTIBELY.
C* -K-    K=1 REFERS TO THE LOWER BOUNDARY--K==2 TO THE UPPER BOUNDARY

      ICRNER= 0
      PBAR(1,1)=P(1,1)
      II=1
      DX3=1.E8
      IF (DUAL) SLOPE(2,1)=VQU(1,2)
C*  -JLBDY-  IS THE VALUE OF -J- AT THE LOWER BOUNDARY...
C*            WHEN A MACHD-SC IS PRESENT, -JLBDY- IS GREATER THAN 1.
      JLBDY=1
      JLBDY1=JLBDY+1
      JT=1
  110 IPR=IPRINT
      NJ=NJJ(JT)
      NJM1=NJJM1(JT)

      CALL CNSERV (1)
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  180 IF (ICRNER.NE.0) GO TO 181
      IF (DUAL) JT=2
  179 NPTSM1=NPTSL(JT)-1
      K=1
      IF (IEND(K,JT).EQ.1) GO TO 182
      CALL CORNER (XLOW(1,JT),YLOW(1,JT),PCONT(K,JT),XL,1,P(1,JT)
     1 ,PBOUND(K,JT))
  182 K=2
      NPTSM1=NPTSU(JT)-1
      IF (IEND(K,JT).EQ.1) GO TO 175
      CALL CORNER (XUP(1,JT),YUP(1,JT),PCONT(K,JT),XL,NJJ(JT),P(1,JT),
     1 PBOUND(K,JT))
  175 CONTINUE
      IF(.NOT. BARPRT) GO TO 1751
      IF (.NOT.DUAL.OR.JT.EQ.2) WRITE (6,OUTPUT)
 1751 CONTINUE
      IF (ICRNER.EQ.(-3)) GO TO 2325
      IF (ICRNER.EQ.(-1)) GO TO 2323
  176 IF (JT.EQ.1) GO TO 1829
      JT=1
      GO TO 179
 1829 IF (ICRNER.NE.0) GO TO 237
      ICRNER=2

  181 DX=DX2

      IF (DX3.LT.DX2) DX=DX3
      IF (DX.LT.0.) GO TO 300
      X=X+DX

C*   ICRNER=-3 SIGNIFIES THE START OF A SHOCK TO A CONSTANT PRESSUEE BOUN
C*   ICRNER=-4 SIGNIFIES THE START OF A MACH DISC CALCULATION
C*   ICRNER=-5 SIGNIFIES THE CONTINUATION OF A MACH DIXC COMPUTATION


      IF (X.LT.(XCRNER-.0010)) GO TO 183
      DX=XCRNER-(X-DX)
      X=XCRNER
      IPR=IPRINT
      INTERV=I1-2

  183 IF (NTKE.LE.0) GO TO 184
      DDX=.00001
C*   PRINT CONTROL AT EXTERNALLY SPECIFIEC LIST OF --X"S--
      IF (X.LT.(XPRINT(JPRINT)-DDX))  GO TO 184
      DX=XPRINT(JPRINT)-(X-DX)
      IPR=IPRINT
      X=XPRINT(JPRINT)
      JPRINT=JPRINT+1

  184 JLBDY=JLBDYS(JT)
      JLBDY1=JLBDY+1
      NJ=NJJ(JT)
      NJM1=NJJM1(JT)
      NJM2=NJJM2(JT)
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      IF (DPSI(JT).GT.0.) GO TO 1842
      IF(BARPRT) WRITE(6,1843) DPSI
 1843 FORMAT (1X,2F16.6)
      DPSI(JT)=PSI(2,JT)-PSI(1,JT)
 1842 CONTINUE
      DXQDSY=DX/DPSI(JT)
C* UPPER BOUNDARY

      K=2
      IF (.NOT.SOLID(K,JT)) GO TO 185
      IF (SSTRM.AND.JT.EQ.1) GO TO 186

C* IF SOLID WALL IS SPECIFIED, CALCULATE SLOPE AND POSITION OF UPPER WAL
      CALL LSPFIT (XUP(1,JT),YUP(1,JT),NPTSU(JT),X,YBAR(NJ,JT),1,0)
      CALL LSPFIT (XUP(1,JT),YUP(1,JT),NPTSU(JT),X,SLOPE(K,JT),1,1)
      IF (.NOT.PCONT(K ,JT)) GO TO 186
C* UPPER PRESSURE BOUNDARY IS SPECIFIEC
  185 CALL LSPFIT (XUP(1,JT),PUP(1,JT),NPTSU(JT), X,PBOUND(K,JT),1,0)

  186 K=1
      IF (ICRNER.EQ.(-5)) GO TO 188
C* LOWER BOUNDARY
      IF (.NOT.SOLID(K,JT)) GO TO 187
      IF (SSTRM.AND.JT.EQ.2) GO TO 188

C* IF SOLID WALL IS SPECIFIED, DETERMINE SLOPE AND POSITION OF LOWER WAL
      CALL LSPFIT (XLOW(1,JT),YLOW(1,JT),NPTSL(JT),X,SLOPE(K,JT),1,1)
      J=1
      CALL LSPFIT (XLOW(1,JT),YLOW(1,JT),NPTSL(JT),X,YBAR(J,JT) ,1,0)
      IF (.NOT.PCONT(K ,JT)) GO TO 188
C* LOWER PRESSURE BOUNDARY IS SPECIFIED
  187 CALL LSPFIT (XLOW(1,JT),PLOW(1,JT),NPTSL(JT), X,PBOUND(K,JT),1,0)
  188 CONTINUE

C1        STEP 1 *****
  190 CALL STEP12 (JLBDY1,NJM1,1)

C*   RESET NJ IN CASE MASS WAS LOST
      NJ=NJJ(JT)
      NJM1=NJJM1(JT)
      NJM2=NJJM2(JT)

      IF (ICRNER.EQ.(-7)) GO TO 2007
      IF (X.LT.XSHOCK(JT).OR.ICRNER.EQ.(-1)) GO TO 2007

      CALL SHOCK(X)
 2007 IF (.NOT.SSTRM) GO TO 2015

C         SSTRM=T IMPLIES THERE IS A SLIPSTREAM (SSTRM) PRESENT
      IF (JT.EQ.1) GO TO 2015
      JT=1
      SLIP=.TRUE.
      NJM21=NJJ(1)-2
      CALL BNDRY (2,NJM21,NJJ(JT))
      SLIP=.FALSE.
```

```
C         AFTER RETURNING FROM BNDRY MUST RESET JT=2

      JT=2
      GO TO 204

  196 ICRNER=2
      GO TO 202
C*  FIRST TIME THROUGH MACH DISC CALCULTATION, OMIY BOUNDARY CALCLLATION
 2015 IF (ICRNER.EQ.(-4)) GO TO 202
C*  ICRNER.EQ.4 REFERS TO SHOCK REFLECTION FROM AXIS OF SYMMETRY
      IF (ICRNER.EQ.4) GO TO 196
      CALL BNDRY (KBDRYL,JLBDY,JLBDY)
C*  FLOW WENT SUPERSONIC THROUGH A CUSP--MOVE MACH DISC FURTHER UPSTREAM
      IF (IDISC.EQ.2) RETURN

  202 IF (.NOT.SSTRM) GO TO 204
      IF (JT.EQ.2) GO TO 204
      GO TO 205

C         EVALUATE UPPER BOUNDADY POINT BY USING CHARACTERISTICS

  204 CALL BNDRY (KBDRYU,NJM2,NJ)

  205 DO 210 J=JLBDY,NJM1
      RBAR(J,JT) = YBAR(J,JT)*RC + (1. - RC)
      TS = PBAR(J,JT)/RHOBAR(J,JT)
  210 UBAR(J,JT) = SQRT((TT(II,JT)-TS)*GAM2(JT)/(1. + VQUBAR(J,JT)*
     1  VQUBAR(J,JT)))

C         BARPRT = T IMPLIES PRINT THE BARRED QUANTITIES

      IF (.NOT.BARPRT) GO TO 215

      CALL TABPRT (6H   PBAR,   PBAR(1,JT),NJ,10,0)
      CALL TABPRT (6H   UBAR,   UBAR(1,JT),NJ,10,0)
      CALL TABPRT (6HVQUBAR,VQUBAR(1,JT),NJ,10,0)
      CALL TABPRT (6H   YBAR,   YBAR(1,JT),NJ,10,0)
      CALL TABPRT (6H   RBAR,   RBAR(1,JT),NJ,10,0)

C1        STEP 2 *****
C*  STORE OLD VALUES OF **P** FOR USE IN *BNDRY* BEFORE THEY ARE DESTROU
  215 IF (SSTRM.AND.JT.EQ.1) CALL BNDRY (0,0,NJ)
      CALL STEP12 (JLBDY1,NJM1,2)
      JLOW=0
      IF (ICRNER.EQ.(-6)) GO TO 2026
      IF (X.LT.XSHOCK(JT).OR.ICRNER.EQ.(-1)) GO TO 2027

 2026 CALL SHOCK2 (X)
      JLOW=JLW
C*  FLOW WENT SUBSONIC WHEN INSERTING A MACH DISC.   RESTART FLOW
      IF (IDISC.EQ.2) RETURN

C*  IF A MACH DISC HAS JUST BEEN INTRODUCED, STORE NEW VALUE OF JLBDY
      IF (ICRNER.EQ.(-4)) JLBDYS(JT)=JLBDY
 2027 IF (Y(JLBDY,JT).GT.0.0) GO TO 222
C*  USE MOC WHEN SHOCK IS CLUSE TO AXIS
```

```
      IF (JLOW.EQ.0) GO TO 2029
      IF (JLOW.LE.3.AND.JLOW.GT.(-2)) GO TO 222
C        AXIS OF SYMMETRY POINT
 2029 J=1
      P(1,JT) = (P(2,JT)*4. - P(3,JT))*.3333333333
 2030 TS=TT(II,JT)*(P(J,JT)/PT(J,JT))**GAM1QG(JT)
      RHO(J,JT)=P(J,JT)/TS
      VQU(J,JT)=0.0
      U(J,JT)=SQRT((TT(II,JT)-TS)*GAM2(JT))
      PBAR(J,JT)=P(J,JT)
      RHOBAR(J,JT)=RHO(J,JT)
      UBAR(J,JT)=U(J,JT)
      VQUBAR(J,JT)=VQU(J,JT)
      GO TO 223

  222 J=JLBDY
 2221 VQU(J,JT)=VQUBAR(J,JT)
      Y(J,JT)=YBAR(J,JT)
      P(J,JT)=PBAR(J,JT)
      RHO(J,JT)=RHOBAR(J,JT)
      U(J,JT)=UBAR(J,JT)

      IF (J.EQ.NJJ(JT)) GO TO 226
  223 IF (JLOW.LT.0) IFIRST=2
      IF (.NOT. DUAL) GO TO 225
      IF (JT.EQ.2) GO TO 224
      JT=2
      GO TO 184

  224 JT=1

C        SOLID WALL BOUNDARY
C        CONSTANT PRESSURE BOUNDARY

  225 J=NJJ(JT)
      JLBDY=JLBDYS(JT)
      GO TO 2221
C*    CHECK GLOBAL CONSERVATION
  226 CALL CNSERV (2)

  232 GO TO 233
C*  START SHOCK TO SOLID WALL
 2323 INTERV=I1
      K=2
      CALL LSPFIT (XUP(1,JT),YUP(1,JT),NPTSU(JT),X,SLOPE(K,JT),1,1)
 2325 J=NJJ(JT)
      JSHOCK=-J
      CALL SHOCK2(X)
      ICRNER=2
      GO TO 176
  233 IF (ICRNER.EQ.(-4)) GO TO 238
      IF (ICRNER.EQ.(-8)) GO TO 260

C*  CALCULATE NEW STEP SIXE, R, AND U
  237 DX2=1.E8
      CALL STPSZE (DX1,NJJ(JT))
```

```
  228 CALL SEARCH(X)
C*  UPON DETECTING A SHOCK, -SEARCH- SETS ICRNER TO -2
      IF (ICRNER.NE.(-2)) GO TO 235
      ICRNER=1
      IPR=IPRINT
  235 IF (.NOT.DUAL) GO TO 240
      IF (ICRNER.EQ.(-6)) ICRNER=0
      IF (JT.EQ.2) GO TO 239
      DX3=DX2
      JT=2
      GO TO 225

  238 ICRNER=-5
C*  STORE LOWER BOUNDARYY VALUES IN -JLBDY-
      PSI(JLBDY,JT)=SYBDY
      R(JLBDY,JT)=R2(2,JT)
      Y(JLBDY,JT)=Y2(2,JT)
  241 L=2
      P(JLBDY,JT)=P2(L,JT)
      U(JLBDY,JT)=U2(L,JT)
      VQU(JLBDY,JT)=VQU2(L,JT)
      RHO(JLBDY,JT)=RHO2(L,JT)
      EXPON=1./GAM1GG(JT)
      PT(JLBDY,JT)=P(JLBDY,JT)*(TT(II,JT)*RHO(JLBDY,JT)/P(JLBDY,JT))**
     1EXPON
      XCRNER=XL
      GO TO 237

  239 IF (ICRNER.NE.(-7)) GO TO 240
      ICRNER=2
      IF (MDISCC) ICRNER=-5

C*  UPDATE TURBULENT KINETIC VALUES
  240 CALL VISCOS (NJ)
      IF (XSAVE.NE.BITS.AND.XSAVE.LE.X) CALL RESTRT (1)
      IF (IPR .LT. IPRINT) GO TO 250
      IPR=0
      CALL PRINT
      IF (ICRNER.EQ.(-3)) GO TO 250

C*****CALL CNSERV (3)
  250 IF (NTKE.LE.0) IPR=IPR+1
      JT=1

      IF (X.LT.XL) GO TO 180
      RETURN
C*  SHOCK IS REFLECTING FROM THE AXIS OF SYMMETRY
  260 ICRNER=2
      GO TO 241

C*  DX .LT. 0.
  300 IF  (DUAL) JT=2
      CALL PRINT
      WRITE (6,1802) DX
      RETURN
```

```
    8 FORMAT(I5)
 1802 FORMAT (5X,31HTHE STEP SIZE HAS GONE NEGATIVE,/,5X,87HPROBABLE CAU
     1SE--FLOW ANGLE IS SO STEEP THAT ONE CHARACTERISTIC ACTUALLY GOES D
     2OWNSTREAM,/,5X,4HDX =,F11.7)
      END
```

```
*DECK STEP12
      SUBROUTINE STEP12(JLBDY1,NJM1,ISTEP)
*STEP12      **STEP12**  CALC. EITHER STEP OF MACCORMACK TWO-STEP PROCED
      COMMON /CNTROP/ EXPOFS,RHS,RHS1
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4       ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5  ,TT(1,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      COMMON /CINPUT/ PT(40,2),DUMINP(648)
      COMMON /CMLIM/ ZMLIM2

      II=1
      GO TO (190,210,310),ISTEP
  190 CALL ENTROP (3,NJM1)

      DO 200 J=JLBDY1,NJM1
      CALL          ENTROP (1,J)
      DXQDSY=DX/(PSI(J+1,JT)-PSI(J,JT))
C*  USE **LN P** VARIABLE
  140 DELTAP=P(J,JT)*ALOG(P(J+1,JT)/P(J,JT))
  150 RHOU=RHO(J,JT)*U(J,JT)
      RHOUU=RHOU*  U(J,JT)
      VQUY=VQU(J,JT)*R(J,JT)
      ZMX2M1=RHOUU/(GAMMA(JT)*P(J,JT))-1.
      VQU2P1=VQU(J,JT)*VQU(J,JT)+1.
      ZM2M1=(ZMX2M1+1.)*VQU2P1

C*  CHECK TO BE SURE VISCOUS FORCE WONT DRIVE FLOW SUBSOINC WHEN MN IS N
C*  --EPISLM-- IS FRACTION OF -PCRIT- TO WHICH -P- IS ALLOWED TO INCREAS
C*  -PT- LOSS
C*  NOTE RHS IS NEGATIVE

C*****RHSMIN=-GAMMA(JT)*.5*ZMX2M1*(ZM2M1-ZMLIM2)*P(J,JT)
C*****IF (RHS.LT.RHSMIN) WRITE (6,2) RHS,RHSMIN,ZMX2M1,ZM2M1,ZMLIM2,
C****1P(J,JT),J,JT
C***2 FORMAT (1X,6F13.6,2I4,18HSTEP12--RHS,RHSMIN)
C*****IF (RHS.LT.RHSMIN) RHS=RHSMIN
      DPX=(DXQDSY*RHOU*(RHOUU        *(VQU(J+1,JT)*R(J+1,JT)-VQUY)+VQUY
     1*DELTAP)+RHS)/ZMX2M1
  160 PBAR(J,JT)=P(J,JT)*EXP(-DPX/P(J,JT))
      VQUBAR(J,JT)=VQU(J,JT)-DXQDSY*R(J,JT)*VQU2P1*DELTAP/U(J,JT)-
     1VQU(J,JT)*(DPX+RHS1)/RHOUU
      YBAR(J,JT) = Y(J,JT) + DX*VQU(J,JT)
      TS=TT(II,JT)*(PBAR(J,JT)/PT(J,JT))**GAM1QG(JT)
  200 RHOBAR(J,JT)=PBAR(J,JT)/TS
      RETURN

  210 J=JLBDY1
  211 JM1=J-1
  212 CALL          ENTROP (2,J)
      DXQDSY=DX/(PSI(J,JT)-PSI(JM1,JT))
  216 DELTAP=PBAR(J,JT)*ALOG(PBAR(J,JT)/PBAR(JM1,JT))
  218 RHOU=RHOBAR(J,JT)*UBAR(J,JT)
```

```
      RHOUU=RHOU*  UBAR(J,JT)
      ZMX2M1=RHOUU/(GAMMA(JT)*PBAR(J,JT))-1.
      VQU2P1=VQUBAR(J,JT)*VQUBAR(J,JT)+1.
      ZM2M1=(ZMX2M1+1.)*VQU2P1
C*****RHSMIN=-GAMMA(JT)*.5*ZMX2M1*(ZM2M1-ZMLIM2)*PBAR(J,JT)
C*****IF (RHS.LT.RHSMIN) RHS=RHSMIN
      VQUY=VQUBAR(J,JT)*RBAR(J,JT)
      DPX=(DXQDSY*RHOU*(RHOUU          *(VQUY-VQUBAR(JM1,JT)*RBAR(JM1,
     1JT))+VQUY*DELTAP)+RHS)/ZMX2M1
      P(J,JT)=SQRT(P(J,JT)*PBAR(J,JT))*EXP(-.5*DPX/PBAR(J,JT))
      VQU(J,JT)=.5*(VQU(J,JT)+VQUBAR(J,JT)-VQUBAR(J,JT)*(DPX+RHS1)/RHOUU
     1-RBAR(J,JT)*VQU2P1*DELTAP*DXQDSY/UBAR(J,JT))
      Y(J,JT) = (YBAR(J,JT) + Y(J,JT) + DX*VQUBAR(J,JT))*.5
      TS=TT(II,JT)*(P(J,JT)/PT(J,JT))**GAM1QG(JT)
  220 RHO(J,JT)=P(J,JT)/TS
      IF (J.EQ.NJM1) RETURN
      J=J+1
      GO TO 211
C*  AXIS OF SYMMETRY POINT
  310 JM1=2
      J=JLBDY1
      GO TO 212
      END
```

```
*DECK STPSZE
      SUBROUTINE STPSZE(DX1,NJ)
*STPSZE      -STPSZE-   CALCULATES STEPSIZE, U, AND R
      COMMON /CMLIM/ ZMLIM
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAMQG(2)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CSERCH/ ISERCH,PSHOCK,JSHK
      COMMON /CINPUT/ PT(40,2),DUMINP(648)
      COMMON /CSHK/ DUMSHK(5),JLOW,JSHOCK,XSHOCK(2),DUSHCK
      COMMON/QSHKPT/SHKPRT
      LOGICAL SHKPRT
      DATA ZMSMIN /1.22/

      II=1
      DTOR=3.14159/180.
      TSCRIT=TT(II,JT)/(1.+(GAMMA(JT)-1.)*.5*ZMLIM)
      ZMLREF= 5.*DTOR
      ZMLINO=-1.E8
      ISERCH=0
      DO 230 J=JLBDY,NJ
      R(J,JT) = Y(J,JT)*RC + (1. - RC)
      TS = P(J,JT)/RHO(J,JT)
      NOSRCH=0
      IF (TS.GT.TSCRIT) GO TO 300
      VQUP1=1.+VQU(J,JT)*VQU(J,JT)
      U(J,JT) = SQRT((TT(II,JT)-TS)*GAM2(JT)/VQUP1)
      ZM2=U(J,JT)*U(J,JT)*VQUP1*RHO(J,JT)/(GAMMA(JT)*P(J,JT))
  120 ZMN(J,JT)=SQRT(ZM2)
C*  --ZMSMIN-- IS MIN MACH NUMBER SQUARED AT WHICH A SHOCK CAN BE INSERT
      IF (ZM2.LT.ZMSMIN) NOSRCH=1
      CTNA=SQRT(ZM2-1.)
      SGN=-1.
      IF (R(J,JT).EQ.0.) GO TO 230
      JJ=J+1
  228 SGN=-SGN
      IF (JJ.GT.NJ) GO TO 229
      SDPSI=SGN*(PSI(JJ,JT)-PSI(J,JT))*STABIL
      COTTH=(CTNA-SGN*VQU(J,JT))/(RHO(J,JT)*U(J,JT)*R(J,JT)*VQUP1)
      DX1=SDPSI*COTTH
      IF (DX1.LT.DX2) DX2=DX1
  229 JJ=J-1
      IF (JJ.LT.JLBDY) GO TO 230
      IF (SGN.GT.0.)  GO TO 228

      TANMLN=(VQU(J,JT)*CTNA-1.)/(CTNA+VQU(J,JT))
      IF (XSHOCK(1).LE.X.OR.XSHOCK(2).LE.X) GO TO 230
C*  CHECK FOR COALESCING CHARACTERISTICS
      ZMLINE=ATAN(TANMLN)
      IF (ZMLINE.GT.(ZMLINO-ZMLREF)) GO TO 2295
```

```
      DPTQDY=ABS(PT(JJ,JT)-PT(J,JT))
      ZMLRES=ZMLREF
      IF (DPTQDY.LT..001) GO TO 2296

C*  IN ROTATIONAL FLOW, CALCULATE MACH ANGLE CHANGE DUE TO TOTAL PRESSUR
C*  RAISE TOLERANCE ON INSERTING A SHOCK BY THIS AMONUT (TO TAKE INTO AC
C*  CURVATURE OF CHARACTERISTICS IN ROTATIONAL FLOW)
      ZM21=(PT(JJ,JT)/P(J,JT))**((GAMMA(JT)-1.)/GAMMA(JT))-1.
      ZM21=ZM21*2./(GAMMA(JT)-1.)
      TMUREF=SQRT(1./(ZM21-1.))
      ANGMUR=ATAN(TMUREF)
      ANGMU=ATAN(1./CTNA)
      ZMLRES=ZMLREF+ABS(ANGMU-ANGMUR)
 2296 CONTINUE
      IF (ZMLINE.GT.(ZMLINO-ZMLRES)) GO TO 2295
C*  START SHOCK AT INNER MOST LOCATION
C*  CROSSING IS BASED ON COMPARING THE COTANGENTS OF TWO ADJACENT CHARAC
C*  **COTTH** IS THE COTANGENT OF THE NNGLE

C*  MAKE SURE A SHOCK IS NOT INSERTED BECAUSE A POINT HAS BEEN RESET SUP
C*  THIS CAN BE A PROBLEM IN LOW MACH NUMBER FIELDS WITH PT GRADIENTS
      IF (NOSRCH.EQ.1) GO TO 240
      ISERCH=1
      PSHOCK=(PSI(J,JT)+PSI(J-1,JT))*.5

  240 DTORI=1./DTOR
      THETA1=ATAN(VQU(J,JT))*DTORI
      THETA2=ATAN(VQU(J-1,JT))*DTORI
      ZMEW1=ATAN(1./CTNA)*DTORI
      ZMEW2=ATAN(1./SQRT(ZMN(J-1,JT)*ZMN(J-1,JT)-1.))*DTORI
      DZMLIN=(ZMLINE-ZMLINO)*DTORI
      ZMLRED=ZMLRES*DTORI
      ZMLIND=ZMLINE*DTORI
      ZMLIOD=ZMLINO*DTORI
      IF (SHKPRT) WRITE(6,1230) J,THETA1,ZMEW1,ZMLIND,JJ,THETA2,ZMEW2,
     1ZMLIOD,DZMLIN,ZMLRED
 2295 ZMLINO=ZMLINE
      GO TO 230
  300 TTQTS=1.+(GAMMA(JT)-1.)*.5*ZMLIM
      TS=TT(II,JT)/TTQTS
      P(J,JT)=PT(J,JT)*TTQTS**(-1./GAMQG(JT))
      RHO(J,JT)=P(J,JT)/TS
      IF (J.EQ.JLBDY) GO TO 310
      CTNA=SQRT(ZMLIM-1.)

C*  KEEP CHARACTERISTICS FROM GOING DOENSTREAM AFTER RESET--KEEEP MACH A
C*  CALC COMPLEMENT OF MACH ANGLE
C*  THIS ASSUMES SIN(X)=X
      VSET=.5*SQRT((ZMLIM-1.)/ZMLIM)
      IF (SHKPRT) WRITE(6,301) J,JSHOCK,VSET,VQU(J,JT),VQU(J-1,J,T)
C*  SET VQU SO THAT MAXH LINES APRE PAEALLEL
      ABSV=ABS(VQU(J,JT))
      IF (ABSV.GT.VSET) VQU(J,JT)=VSET*ABSV/VQU(J,JT)
      VQUP1 = 1.+VQU(J,JT)**2
  310 CONTINUE
```

```
      U(J,JT) = SQRT((TT(II,JT)-TS)*GAM2(JT)/VQUP1)
      IF(SHKPRT) WRITE(6,301)J,JT,U(J,JT),P(J,JT),RHO(J,JT),ZM2
      ZM2=ZMLIM
      GO TO 120
  230 CONTINUE
      RETURN

  301 FORMAT (26H FLOW WENT SUBSONIC AT J =,I3,4HJT =,I2,11HU,P,RHO,ZM2,
     14F10.6)
 1230 FORMAT (1X,28HCHARACTERISTICS HAVE CORSSED,/,10X,20HANGLES IN DEGR
     1EES    ,/,2X,14HTOP GRID POINT,5X,3HJ =,I3,10H    THETA =,F10.4,15H
     2  MACH ANGLE =,F10.4,13H    THETA-MU =,F10.4,/,2X,17HBOTTOM GRID PO
     3INT,2X,3HJ =,I3,10H    THETA =,F10.4,                           15H
     4  MACH ANGLE =,F10.4,13H    THETA-MU =,F10.4,/,
     52X,35HCONVERGENGE BETWEEN CHARACTERISTICS,F10.4,20H   REFERENCE CA
     6LUE      ,F10.4)
      END
```

```
*DECK TKESHK
      SUBROUTINE TKESHK(LOCATE,K)
*TKESHK       -TKESHK-    CALC TURBULENCE AMPLICICATION ACROSS SHOCK
      DIMENSION SPDRAT(16),AMPOFE(16)
      DIMENSION DRHS(3,1)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),          R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JTT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAMIQ2(2)
      COMMON /CVISHK/ A2(3,1),A1(3,1),BETA2(3,1),BETA1(3,1)
      COMMON /CTRIDI/ COEFL(46),COEFC(46),COEFR(46),RHS(46)
      COMMON /CPBOLI/ A(46,1),ALPHA(1,1),BETA(46,1),GAMM(46,1),
     1  DELTA(46,1)
      COMMON /CENDS/ JSTART,JEND
      COMMON /CSHK/ TANS1,DSHOCK,PSISHK,DELP,DELVQU,JLWW,JSHK
     1,XSHOCK(2),YSHOCK
      COMMON /CSHOCK/ P1(5,2),U1(5,2),RHO1(5,2),VQU1(5,2),P2(5,2)
     1,U2(5,2),RHO2(5,2),VQU2(5,2),Y2(5,2),R2(5,2)
      COMMON /CSTOR2/          DX1,SGN,I1,IEND(2,2)
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1  ,DX3,TS,DPSI(2)
      COMMON /CJLBYS/ JLBDYS(2)
      COMMON /CTHETA/ THETA,II
      COMMON /CTKESH/ RJ,EJ,SQRTEJ,EJI,UJ,ZMU ,ZMJET
      COMMON /CCRNER/ NPTSM1,KDUM,ICRNER,XCRNER
      COMMON /CXDISC/ XMDISC,XSAVE,IDISC,MDISCC
      COMMON /CRFLCT/ IGO,ICHNG,ISIGN
      COMMON /CTKEPR/ XTKEPR,XTKESH,XTKESF
      LOGICAL ENTRY1,DSHOCK,MDISCC
      DATA ENTRY1 /.TRUE./,JSHOCK /-1/
      DATA SPDRAT,AMPOFE /1.,1.33,1.67,2.,2.33,2.67,3.,3.33,3.67,
     1   4.,4.33,4.67,5.,5.33,5.67,6.,1.,1.08,1.17,1.21,1.25,1.27,1.31,
     2 1.31,1.32,1.33,1.34,1.345,1.34,1.33,1.325,1.32/
      JDUAL=0
      JT=JTT
  200 IF (X.LT.XSHOCK(JT)) GO TO 6000
      IF (LOCATE.NE.3) GO TO 230
C*   SHOCK IS REFLECTING FROM A TRIPLE POINT
      JLBDY1=JLBDYS(JT)-1
      ZMNORM=ZMN(JLBDY1,JT)**2
      L=3
      A1(L,K)=A1(1,K)
      GO TO 440
  230 L=1
      IF (JLWW.LT.0) GO TO 300
C*   DOWNSHOCK
  250 JLW=JLWW
  251 LSH=1
      ISIGN=1
      SUP=0.
      SDOWN=1.
      GO TO 400
C*   UPSHOCK
  300 IF (IGO.LT.1) GO TO 2600
```

```
      LSH=2
      JLW=-JLWW
      ISIGN=-1
      SUP=1.
      SDOWN=0.
  400 JADJUS=0
      IF (JLOW.EQ.3.AND.JSHOCK.EQ.4) ICHNG=1
      IF (JT.EQ.2) JADJUS=NJJ(1)
      JLOW=JLW+JADJUS+JDUAL
      IF (JSHOCK.EQ.(-1)) JSHOCK=JLOW

C*  L=2  STORES SHOCK JUMP AT OLD X-STATION
C*  L=1  STORES SHOCK JUMP AT NEW X-STATION
C*  LOCATE=1  FOR NEW X-STATION--ADJUXT COEFFICIENTS,ETC
C*  LOCATE=2  FOR OLD X-STATION--CALC DRHS BEFORE OLD COEFFICIENTS ARE D

C*  -ZMNORM-  IS THE MACH MUNBER MORMAL TO THE SHOCK
C*  -AMPOFE-  IS THE AMOUNT BY WHICH THE TKE IS AMPLIFIED BY THE SHOCK--
C*            I.E.  E2=AMPOFE-E1

      IF (LOCATE.EQ.2.AND..NOT.ENTRY1) GO TO 2000
      ENTRY1=.FALSE.

C*  FIRST TIME THROUGH, MUST CALC A2 AND A1
      JSM1=JSHOCK-ISIGN-JDUAL
      A1(L,K)=A(JSM1,K)
      ZM=U1(LSH,JT)*U1(LSH,JT)*(1.+VQU1(LSH,JT)*VQU1(LSH,JT))*RHO1(LSH
     1,JT)/  (GAMMA(JT)*P1(LSH,JT))
      ZMNORM=ZM*(VQU1(LSH,JT)-TANS1)**2
      ZMNORM=ZMNORM/((1.+VQU1(LSH,JT)*VQU1(LSH,JT))*(1.+TANS1*TANS1))
      IF (ZMNORM.LT.1.) ZMNORM=1.
  440 SPEED=(GAMMA(JT)+1.)*ZMNORM/(2.+(GAMMA(JT)-1.)*ZMNORM)
      CALL LSPFIT (SPDRAT,AMPOFE,16,SPEED,AMPLFY,1,0)
      A2(L,K)=A1(L,K)*AMPLFY
      IF(X.GT.XTKESH.AND.X.LT.XTKESF)
     1WRITE  (6,1) JLOW,JSHOCK,A1(L,K),A2(L,K)
      IF (JLOW.EQ.4.AND.DSHOCK) ICHNG=3
      IF (JLOW.EQ.3.AND..NOT.DSHOCK) ICHNG=3
      IF (JLOW.EQ.4.AND..NOT.DSHOCK) ICHNG=0
      IF (X.GT.XTKESH.AND.X.LT.XTKESF) CALL TABPRT (4HDRHS,DRHS,3,3)
      IF (LOCATE.EQ.3) RETURN
C*    STORE NEW VALUES IN L=2 LOCATION FOR THE NEXT TIME

C*  -SPDRAT-  IS THE RATIO OF NORMAL SPEEDS ACROSS THE SHOCK

      GO TO 3000

 1000 AAAA=ALPHA(II,K)*DX*THETA*.5/(DPSI(JT)*DPSI(JT))
      IF (JLOW.EQ.JSHOCK) GO TO 1400
C*  SHOCK HAS CROSSED A GRID POINT
      J=JLOW-1
      DAK=A2(L,K)-A1(L,K)
      DCR=-AAAA*(BETA2(L,K)-BETA1(L,K))
      COEFR(J)=COEFR(J)-DCR
      COEFC(J)=COEFC(J)+DCR
      RHS(J)=RHS(J)+COEFR(J)*DAK+DRHS(3,K)
```

```
      J=JLOW
      DCL=DCR
      COEFL(J)=COEFL(J)+DCL
      COEFC(J)=COEFC(J)-DCL
      RHS(J)=RHS(J)+DRHS(2,K)-COEFL(J)*DAK
      IF (JLOW.EQ.3) GO TO 1350
 1290 CONTINUE
      J=JLOW+1
      RHS(J)=RHS(J)+DRHS(1,K)
 1300 JSHOCK=JLOW
      RETURN

C*  SHOCK IS NEAR AXIS OF SYMMETRY
 1350 RHS(JLOW)=RHS(JLOW)+DAK*(COEFL(J)+DCR)
      GO TO 1290

C*    SHOCK REMAINS BETWEEN SAME TWO GRID POINTS
 1400 J=JSHOCK-ISIGN
      COEFC(J)=COEFC(J)+DCR
      COEFR(J)=COEFR(J)-DCR*SDOWN
      COEFL(J)=COEFL(J)-DCR*SUP
      RHS(J)=RHS(J)+DRHS(2,K)+(COEFR(J)*SDOWN+COEFL(J)*SUP)*DAK
      DCR=-AAAA*(BETA2(L,K)-BETA1(L,K))
      DAK=A2(L,K)-A1(L,K)
      J=JSHOCK
      COEFC(J)=COEFC(J)-DCL
      COEFL(J)=COEFL(J)+DCL*SDOWN
      COEFR(J)=COEFR(J)+DCL*SUP
      RHS(J)=RHS(J)+DRHS(1,K)-(COEFL(J)*SDOWN+COEFR(J)*SUP)*DAK
      DCL=-AAAA*(BETA2(L,K)-BETA1(L,K))
      DCL=DCR
      GO TO 1300
C*  MUST COAL. DRHS BEFORE UPDATING VOEFFICIENTD
 2000 AAAA=ALPHA(II,K)*DX*(1.-THETA)*.5/(DPSI(JT)*DPSI(JT))
      IF (JLOW.EQ.JSHOCK) GO TO 2400
      DCL= AAAA*(BETA2(L,K)-BETA1(L,K))
      DCR=DCL
      DAK=A2(L,K)-A1(L,K)
      DRHS(3,K)=0.
      J=JLOW
      J1=J-JDUAL
      B=(1.-THETA)*DX
      J1P1=J1+1
      IF (J1.EQ.JADJUS) J1P1=J1+2
      DRHS(2,K)=(1.-(COEFR(J)+DCR)+B*(DELTA(J1,K)+DDEL))*DAK+DCR*(2.*
     1  A(J1-1,K)-3.*A(J1,K)+A(J1P1,K))+B*(DDEL*A(J1,K)+DGAM)
      J=JLOW+1
      J1=J-JDUAL
      J1M1=J1-1
      IF (J1M1.EQ.JADJUS) J1=J1+1
      DRHS(1,K)=DCL*A(J1M1,K) +DCL*DAK+COEFL(J)*DAK-DCL*A(J1,K)
 2300 RETURN
 2400 J=JSHOCK-ISIGN
      J1=J-JDUAL
      DCR= AAAA*(BETA2(L,K)-BETA1(L,K))
      DCL=DCR
```

```
      DAK=A2(L,K)-A1(L,K)
      J11=J1+ISIGN
      DRHS(2,K)=DCR*(A(J1,K)-A(J11,K)+DAK)-(SDOWN*COEFR(J)+SUP*COEFL(J))
     1*DAK
      J=JSHOCK
      J1=J-JDUAL
      J11=J1-ISIGN
      DRHS(1,K)=DCR*(A(J11,K)-A(J1,K)+DAK)+(SDOWN*COEFL(J)+SUP*COEFR(J))
     1*DAK
      GO TO 2300

C*  FIRST TMIE THROUGH SINCE A MACH DISC HAS BEEN INSERTED
C*  IGO=0   IS FOR DOWNSHOCK
C*  IGO=1   IS FOR CONTINUATION OF UPSHOCK
C*  IGO=2   IS FOR START OF UPSHOCK IN PRESENCE OF MDISC
C*  IGO=3   IS FOR START OF UPSHOCK
 2600 JLW=-JLWW
      IF (LOCATE.EQ.2) GO TO 251
      IGO=3
      IF (MDISCC) IGO=2
      GO TO 251

C*  CALCULATES JUMP CONTITIONS IN BETA,DELTA, AND GAMM
 3000 GC=32.174
      ZLT=ZMIXL(X)
      SQRTE=SQRT(A2(L,K))
      REYT=RHO2(LSH,JT)*ZLT*SQRTE*SQRTEJ/(ZMU*UJ)
      D=1.+.2*.586*REYT
      RUY=RHO2(LSH,JT)*U2(LSH,JT)*R2(LSH,JT)*R2(LSH,JT)
      JSH=JSHOCK-JADJUS-JDUAL
      JSM1=JLW-ISIGN
      IF (JSM1.LT.1) JSM1=1
C*  SPECIAL CASE FOR SHOCK REFLECTION FROM TRIPLE POINT
      IF (IGO.EQ.2) JSH=JSH+1
      IF (JSH.GT.NJJ(JT)) JSH=NJJ(JT)

C*  CORRECTION FOR CASE WHERE PSISHK IS VERY NEAR PSI(JSH,HT)
      DPSYSH=ABS(PSI(JSH,JT)-PSISHK)
      IF (DPSYSH.LT.(.3*DPSI(JT)).AND.JSH.LT.NJJ(JT)) JSH=JSH+ISIGN
      IF (JSH.LT.1) JSH=1
      IF(JSH.EQ.1.AND.PSI(1,2).EQ.PSISHK) GO TO 396
      DUQDSY=(U(JSH,JT)-U2(LSH,JT))/(PSI(JSH,JT)-PSISHK)
      GO TO 397
  396 NJJT=NJJ(1)-1
      DUQDSY=(U(NJJT,1)-U2(LSH,2))/(PSI(NJJT,1)-PSISHK)
  397 CONTINUE
      DUQDSY=DUQDSY*DUQDSY
      ZMUT=ZMU*.2*REYT
      BETA2(L,K)=ZMU*D*RUY
      GAMM2=RUY*DUQDSY*ZMUT*EJI*UJ*UJ
      DELTA2=-ZMU*D*2.59/(RHO2(LSH,JT)*U2(LSH,JT)*ZLT*ZLT)
      IF (X.GT.XTKFSH.AND.X.LT.XTKESF) GO TO 700
  701 CONTINUE
      SQRTE=SQRT(A1(L,K))
      REYT=RHO1(LSH,JT)*ZLT*SQRTE*SQRTEJ/(ZMU*UJ)
      D=1.+.2*.586*REYT
```

```
      RUY=RHO1(LSH,JT)*U1(LSH,JT)*R2(LSH,JT)*R2(LSH,JT)

C*  CORRECTION FOR CASE WHWRE PSISHK IS VERY NEAR PSI(JSM1,JT)
      DPSYSH=ABS(PSI(JSM1,JT)-PSISHK)
      IF (DPSYSH.LT.(.3*DPSI(JT)).AND.JSM1.GT.1) JSM1=JSM1-ISIGN
      IF (JSM1.GT.NJJ(JT)) JSM1=NJJ(JT)
      DUQDSY=(U1(LSH,JT)-U(JSM1,JT))/(PSISHK-PSI(JSM1,JT))
      DUQDSY=DUQDSY*DUQDSY
      ZMUT=ZMU*.2*REYT
      BETA1(L,K)=ZMU*D*RUY
      GAMM1=RUY*DUQDSY*ZMUT*EJI*UJ*UJ
      DELTA1=-ZMU*D*2.59/(RHO1(LSH,JT)*U1(LSH,JT)*ZLT*ZLT)
      IF (X.GT.XTKESH.AND.X.LT.XTKESF)
     1WRITE (6,2) DUQDSY,ZMUT,BETA1(L,K),GAMM1,DELTA1,RUY
      DGAM=GAMM2-GAMM1
      DDEL=DELTA2-DELTA1
  500 GO TO (1000,2000) ,LOCATE

 6000 IF (JT.EQ.1) RETURN
      JDUAL=1
      JT=1
      GO TO 200

  700 WRITE (6,2) DUQDSY,ZMUT,BETA2(L,K),GAMM2,DELTA2,RUY
      WRITE (6,3) JSH,JSM1,JDUAL,JT,LSH,U(JSH,JT),U2(LSH,JT),PSI(JSH,JT)
     2,PSISHK
      WRITE (6,3) JSH,JSM1,JDUAL,JT,LSH,U1(LSH,JT),U(JSM1,JT),PSISHK
     2,PSI(JSM1,JT)
      WRITE (6,2) U(JSH-1,JT),U(JSH,JT),U(JSH+1,JT),U(JSH+2,JT),
     1U2(LSH,JT),U1(LSH,JT)
      GO TO 701

    1 FORMAT (1X,6HTKESHK,2I6,2F20.8)
    2 FORMAT (1X,6F20.8)
    3 FORMAT (5I6,21HJSH,JSM1,JDUAL,JT,LSH,/,8F14.7,11HU,U,PSI,PSI)
      END
```

```
*DECK TRIDIA
      SUBROUTINE TRIDIA(J,NN)
*TRIDIA       SOLUTION OF TRI-DIAFONAL SYSTEM OF EQUATIONS

      COMMON /CTRIDI/ A(46,3),B(46)

C*         THIS ROUTINE FINDS THE SOLUTION OF A TRIDIAGONAL SYSTEM OF EQUA
C* THE MATRIX -A- CONTAINS THE TRIDIAGONAL COEFFICIENT MATRIX
C* THE MATRIX -B- CONTAINS  THE RHS VECTOR
C*  THE SIZE OF THE MATRIX IS (NN+1)X(NN+1)

      A(J,3)=A(J,3)/A(J,2)
      B(J)=B(J)/A(J,2)

      JP1=J+1
      NNM1=NN-1
      DO 20 N=JP1,NNM1
      A(N,2)=1./(A(N,2)-A(N,1)*A(N-1,3))
      A(N,3)=A(N,3)*A(N,2)
   20 B(N)=(B(N)-A(N,1)*B(N-1))*A(N,2)

C*         BQCK SUBSTITUTION
C* STORE SOLUTION VECTOR IN RHS VECTOR LOCATION

      N=NN
      A(N,2)=1./(A(N,2)-A(N,1)*A(N-1,3))
      B(N)=(B(N)-A(N,1)*B(N-1))*A(N,2)
  260 IF (N-J) 300,300,270
  270 N=N-1
      B(N)=B(N)-A(N,3)*B(N+1)
      GO TO 260
  300 CONTINUE

      RETURN
      END
```

```
*DECK VISCOS
      SUBROUTINE VISCOS(NJJT)
*VISCOS        CONTROL ROUTINE FOR TKE EQUATION
      COMMON /CTHETA/ THETA,II
      COMMON /CINIT/ NJJ(2),NJJM1(2),NJJM2(2),STABIL,X,XL,IPRINT,DX2
     1 ,DX3,TS,DPSI(2)
      COMMON /CENDS/ JSTART,JEND
      COMMON /CJLBDY/ JLBDY,JLBDY1,SYBDY
      COMMON /CPBOLI/ A(46,1),ALPHA(1,1),BETA(46,1),GAMM(46,1),
     1  DELTA(46,1)
      COMMON /CBNDRY/ RHO(23,2),P(23,2),U(23,2),Y(23,2),VQU(23,2)
     2  ,PSI(23,2),           R(23,2),YBAR(23,2),RHOBAR(23,2),UBAR(23,2)
     3  ,VQUBAR(23,2),RBAR(23,2),PBAR(23,2),PSI2( 1,2),ZMN(23,2)
     4        ,PBOUND(2,2),DX,RNJ,JT,RC,DXQDSY,PSI1,YCALC,SLOPE(2,2)
     5 ,TT(1,2)
      COMMON/COMPIL/ DM104(104),VJET
      COMMON /TKEIN/ XTKE(20),TKEBDY(20),NTKE,XLTKE(20),MJET,XDUM(100),
     1 EJ,TJET,DIAJ
      COMMON /CTKESH/ RJ,EJET,SQRTEJ,EJI,UJ,ZMU,ZMJET
      COMMON /CLOGIC/DDD(4),DUAL,DDM(3),BARPRT,DDDM(5)
      COMMON /CSHK/ TANS11,DSHOCK,DUMSHK(8)
      COMMON /CGAM/ GAMMA(2),GAM1(2),GAMI(2),GAM2(2),GAM1QG(2)
      LOGICAL BARPRT
      LOGICAL DSHOCK,DUAL,ENTRY1
      REAL MJET
      DATA    ENTRY1,NE /.TRUE.,1/

C*  -XTKE,TKEBDY-  IS A TABLE OF VALUES OF TKE ON THE JET BOUNDARY
C*  -NTKE-   IS THE NUMBER OF POINTS IN THE TKE BOUNDARY TABLE
      IF (DSHOCK) MSHOCK=1

C*  FOR DUAL FLOW CASES,CALCULATE VISCOUS EFFECTS FOR BOTH STREAMS IN
C*  THE SECOND PASS
      THETA=.6
    5 NJ=NJJ(JT)
      GO TO (10,20),JT
   10 JSTART=JLBDY
      JEND=NJ
      GO TO 30
   20 JSTART=NJJ(1)+1
      JEND=NJJ(1)+NJJ(2)
   30 CONTINUE
      IF (ENTRY1) GO TO 100
      CALL PBOLIC (NE)
      RETURN

C*  FIRST TIME TJROUGH--SET UP -E- FIELD
  100 ENTRY1=.FALSE.
      ZMJET=MJET
      RJ=DIAJ/(12.*2.)
C*  --TKEBDY-- IS STORDD IN TERMS OF TURBULENCE INTENSITY
C*  CONVERT EJ AND TKEBDY FROM INTENDITY TO ENERGY
      EJQEJ=1.
C*  NOTE--  -TIJET- MUST BE READ IN FROM JETMIX-- THEN CONVERT TO EJ
C*           -ED-      SHOULD BE USED TO DETERMINE TKEBDY
C*           -ED-  IS THE VARIABLE USED IN SSFD
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```
      TIJET=EJ
      TIJET2=TIJET*TIJET
C*  SET UP PROPER SCALING BETWEEN -JETMIX- AND--SSFD-
C*  NOTE --TOTAL PRESSURE AND TOTAL TEMPERATURE ARE THE SAME IN -JETM-X
C*  -/SSFD-,   JETMIX USES THE WRONG STATIC PRESSURE, MACH NUMBER, STATI
C*     ATURE, AND ETC.
C*  CALCUALTE STATIC TEMPERATURE IN DEGREES RANKINE
      TTJET=TJET*(1.+(GAMMA-1.)*.5*MJET*MJET)
      TSDEGR=TTJET/(1.+(GAMMA-1.)*.5*ZMN(1,1)*ZMN(1,1))
C*  CALCULATE SPEED OF SOUND--FT/SEC
      GC=32.174
      RGAS=53.35
      AFTSEC=SQRT(GAMMA*GC*RGAS*TSDEGR)
C*  CALCUAATE ACTUAL JET VELOCITY IN FT/SEC---NOTE THIX WILL DIFFER FROM
C*  **VJET**
      UJET=AFTSEC*ZMN(1,1)
C*  CALUCLATE REFERENCE VELOXITY USED IN SSFT
C*  THIS FEFERENCE VELOCITY WILL BE USED TO SCALE TKE
      UJ=UJFT/U(1,1)
C*  CALCULATE **E** IN FT/SEC-- MUST USE *VJET* FROM -JETMIX-

      EJET=1.5*TIJET*TIJET*VJET*VJET
      IF(BARPRT) WRITE (6,1)TIJET,EJET,UJET,EJ,VJET,ZMU
  205 DO 200 J=JSTART,JEND
      A(J,NE)=EJQEJ
  200 CONTINUE
      NJK=NJ
      IF (JT.EQ.2) NJK=NJ+NJJ(1)
      IF (JT.EQ.2.OR..NOT.DUAL) A(NJK,NE)=TKEBDY(1)
      IF(BARPRT)
     1CALL TABPRT (6HTKE    ,A(JSTART,NE),NJ,10)

C*  SET UP COEFFICIENTS AT THE INITIAL
      CALL COEFF (NE)
      IF (.NOT.DUAL) RETURN
      GO TO (400,300),JT


  300 JT=1
      ENTRY1=.TRUE.
      GO TO 5
  400 JT=2
      EJ=EJET
      RETURN
    1 FORMAT (2X,6HVISCOS,5X,28HTIJET,EJET,UJET,EJ,VJET,ZMU, 6F15.4)
      END
```

```
*DECK ZMIXL
      FUNCTION ZMIXL(X)
*ZMIXL        -ZMIXL-  CALC. MIXING LENGTH
      COMMON /TKEIN/ XTKE(20),TKEBDY(20),NTKE,XLTKE(20),DUM(104)
C*    INTERPOLATE IN JETMIX RESULTS TO FIND XLN/RJ
      CALL LFIT(XTKE,XLTKE,NTKE,X,ZXLN,1,0)
      ZMIXL=ZXLN
      RETURN
      END
```

```
*DECK MERGE
      OVERLAY(SSNOISE,3,0)
      PROGRAM MERGE
CMERGE        MERGE JETMIX SSFD PROFILES

      LOGICAL ERR
      LOGICAL FOUND,BAND3,DUAL
      REAL MJET,ME,MUREF
      COMMON/TAG/NAME(10),TITLE(10),IDENT(10),ADDRES(10),
     * IDENT1(10)
      COMMON/CBITS/ QBITS,BLANK
      COMMON /FILINO/ KREC,KXX
      COMMON /CDUMR1/
     * TWODT(9),BITS,ERR,FOOT,AXI,NJ,NM,UE,MIXPRE,XLC,FLOWJ,
     * MERG,NV,CON1,CT1,CT2,CT3,CT4,CT5,CT6,CT7,
     * CT8,CT9,CTP,CTS,CTM,SP,SV,SLEN,DPRIN,PLOT,MIX,CF,MAXIT,
     * TOL,SUPB,XPRN(100),R(100),UC(100),TC(100),TIC(100),
     * PTC(100),WJ(100),YJ(100),TTC(100),YSONIC(100),YCB(100),
     * XD(100),RD(100),YR(100),YCD(100),PD(100),WV(100),MA2(100),
     * VE2(100),TE2(100),ID,NC,CNAME(6),ALJ(6),ALJO(6),
     * ALE(6),SCM(6),DIFF
      INTEGER XPRN
      COMMON /CDUMR2/ NREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * TID(200),U(200),T(200),XMACH(200),PTOT(200),
     * TTD(200),PTD(200),MOLF1(200),MOLF2(200),MOLF3(200),
     * MOLF4(200),MOLF5(200),MOLF6(200),JD
      DIMENSION PSI1(200)
      DIMENSION YS(23,2),PSIS(23,2),P(23,2),PT(40,2),ZMN(23,2),TKE(46),
     X  NJJ(2)
      DIMENSION TT(46)
      DIMENSION UD(200),THD(200),ED(200),XLN(200),RHO(200),Y(200),
     X  TOT(200),PSI(200),X(100)
      DIMENSION UD1(200),THD1(200),ED1(200),XLN1(200),RHO1(200),Y1(200)

      COMMON /TROUBL/ CERR,ENDJOB
       LOGICAL          CERR,ENDJOB
      COMMON/FILES/OPGF,UPDF,NEWF,SCRF
      COMMON/FILK/CSC
      COMMON/CUPDAT/MAP,IMAP,NDIGIT(14)
      COMMON/KEYS/KEY(11),KEYB(11),KODA(11),KODB(11)
      COMMON/CPILE/  YS,PSIS,P,PT,ZMN,TKE,NJJ,XLJ,DUAL
     X               ,NPD,UD,THD,ED,XLN,RHO,Y,TOT,PSI
     X                 ,GC,GCJ,
     X  DIAJ,MJET,TJET,PTJET,VJET,TIJET,EJET,
     X  PE,TE,VE,ME,TIE,
     X  GAM,RG,PR,PRT,SC,TREF,MUREF,C6,PI,X,NXTA,BAND3

      DUAL=.TRUE.
      XLJ   = 0.

* READ INPUT RECORD FROM JETMIX FILE

      READ (2) KXX1,KREC,
     * NAME,TITLE,IDENT,ADDRES,IDENT1,
     * TWODT
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     * BITS,ERR,GC,GCJ,FOOT,
     * DIAJ,MJET,TJET,PTJET,VJET,TIJET,EJET,
     * PE,VE,ME,TIE,TE,AXI,NJ,NM,
     * UE,MIXPRE,XLC,FLOWJ,MERG,NV,CON1,
     * CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CTP,CTS,CTM,
     * GAM,RG,PR,PRT,SC,TREF,MUREF,SP,SV,SLEN,DPRIN,PLOT.
     *C6,MIX,CF,MAXIT,TOL,SUPB  ,
     *X,XPRN,B,UC,TC,TIC,PTC,WJ,YJ,TTC,
     * YSONIC   ,
     *YCB,XD,RD,YR,YCD,PD,WV,MA2,VE2,TE2,NXTA,ID,
     *NC,CNAME,ALJ,ALJO,ALE,SCM,DIFF
      DO 1000  I=1,NXTA
      JEND=0
* READ PROFILE FROM JETMIX FILE
      KXX1  = CSC*X(I)+.5
      READ (2) JREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,ED,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,JD
      IF( KXX.NE.KXX1 ) WRITE (6,9010) X(I)
 9010 FORMAT(//10X,23HRECORD FOR STATION X = ,F12.6,10H NOT FOUND)
      IF(I .GT. 1)  GO TO 40
* CALCULATE TOT FOR INITIAL PROFILE
      DO 25  J=1,NPD
      TS=THD(J)*TJET
      GAM1=2.23708/TS**.070271
      IF(TS .LE. 800.)  GAM1=1.4
      IF(TS .GE. 3600.)  GAM1=1.254
      CP=GAM1*RG/778./(GAM1-1.)
   25 TOT(J)=TS+.5*(UD(J)*VJET)**2/(GCJ*CP)+EJET*ED(J)/CP
   40 CONTINUE

   41 IF( X(I).GT.XLJ ) GO TO 150

* READ PROFILE FROM SSFD FILE
      READ (3) JREC,JXX,YS,PSIS,P,PT,ZMN,TKE,NJJ,XLJ,DUAL
      IF( JXX.NE.KXX ) GO TO 41

* SAVE JETMIX VALUES
      CALL MOVE(5,UD,UD1,NPD,1,THD,THD1,NPD,1,ED,ED1,NPD,1,
     * XLN,XLN1,NPD,1,RHO,RHO1,NPD,1)
      CALL MOVE(2,Y,Y1,NPD,1,PSI,PSI1,NPD,1)
      NPD1=NPD

* CALCULATE SCALE FACTOR FOR PSI COORDINATES
      IF(I .GT. 1)  GO TO 45
      NJ=NJJ(1)
      DELPS1=PSIS(NJ,1)-PSIS(1,1)
      NJ=NJJ(2)
      DELPS2=0.
      IF(DUAL)  DELPS2=PSIS(NJ,2)-PSIS(1,2)
      DPSIPT=PSI(NPD)-PSI(1)
      PSIRAT=(DELPS1+DELPS2)/DPSIPT
   45 CONTINUE

      JSTART=1
```

```
      JTT=1

   50 NJ=NJJ(JTT)
      IF(DUAL .AND. JTT .EQ. 1)  NJ=NJ-1

* SCALE SSFD COORDINATES
      DO 60  J=1,NJ
   60 PSIS(J,JTT)=PSIS(J,JTT)/PSIRAT

* INTERPOLATE ON PSI TO GET JETMIX VALUES AT SSFD COORDINATES
      CALL LSPFIT(PSI1,TOT,NPD,PSIS(1,JTT),TT(JSTART),NJ,0)
      CALL LSPFIT(PSI1,XLN,NPD,PSIS(1,JTT),XLN,NJ,0)

      JEND=JSTART+NJ-1
      DO 75  J=JSTART,JEND
      K=J-JSTART+1
      PSI(J)=PSIS(K,JTT)
      THD(J)=TT(J)/(1.+(GAM-1.)/2.*ZMN(K,JTT)**2)
      P(K,JTT)=P(K,JTT)*PTJET
      ASPEED=SQRT(GAM*GC*RG*THD(J))
      UD(J)=ASPEED*ZMN(K,JTT)/VJET
      RHO(J)=144.*P(K,JTT)/(RG*THD(J))
      THD(J)=THD(J)/TJET
      L=J
      IF(JTT .EQ. 2)  L=J-1
      ED(J)=TKE(L)
      Y(J)=YS(K,JTT)
   75 CONTINUE

      IF(.NOT. DUAL  .OR.  JTT .EQ. 2)  GO TO 80
      JSTART=NJ+1
      JTT=2
      GO TO 50

   80 CONTINUE

* FIND SUBSCRIPT OF FIRST JETMIX POINT TO BE USED
      DO 85  J1=1,NPD
      IF(PSI1(J1) .GT. PSIS(K,JTT))  GO TO 90
   85 CONTINUE
      NPD=JEND
      GO TO 150

   90 NJ1=NPD-(J1-1)
      NPD=JEND+NJ1
      J=JEND+1

      CALL MOVE(5,UD1(J1),UD(J),NJ1,1,THD1(J1),THD(J),NJ1,1,
     * ED1(J1),ED(J),NJ1,1,XLN1(J1),XLN(J),NJ1,1,
     * RHO1(J1),RHO(J),NJ1,1)
      CALL MOVE(1,PSI1(J1),PSI(J),NJ1,1)

* SCALE JETMIX Y COORDINATES
      CALL LSPFIT(PSI1,Y1,NPD1,PSIS(NJ,JTT),Y0,1,0)
      Y(J)=SQRT(Y(J-1)**2+Y1(J1)**2-Y0**2)
      JP1=J+1
```

```
      IF(JP1 .GT. NPD)  GO TO 150
      DO 100  IJ=JP1,NPD
      IJ1=J1+(IJ-J)
  100 Y(IJ)=SQRT(Y(IJ-1)**2+Y1(IJ1)**2-Y1(IJ1-1)**2)
  150 IF( I.GT.1 ) GO TO 151
      WRITE (4) KXX1,KREC,
     * NAME,TITLE,IDENT,ADDRES,IDENT1,
     * TKODT  ,
     * BITS,ERR,GC,GCJ,FOOT,
     * DIAJ,MJET,TJET,PTJET,VJET,TIJET,EJET,
     * PE,VE,ME,TIE,TE,AXI,NJ,NM,
     * UE,MIXPRE,XLC,FLOWJ,MERG,NV,CON1,
     * CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CTP,CTS,CTM,
     * GAM,RG,PR,PRT,SC,TREF,MUREF,SP,SV,SLEN,DPRIN,PLOT,
     *C6,MIX,CF,MAXIT,TOL,SUPB ,
     *X,XPRN,B,UC,TC,TIC,PTC,WJ,YJ,TTC,
     * YSONIC  ,
     *YCB,XD,RD,YR,YCD,PD,WV,MA2,VE2,TE2,NXTA,ID,
     *NC,CNAME,ALJ,ALJO,ALE,SCM,DIFF

  151 IF( XPRN(I).GT.0 ) WRITE (6,175) X(I)
  175 FORMAT(1H1,24X,30HMERGED JETMIX AND SSFD PROFILE/31X,8HFOR X = ,
     X  F8.4//10X,1HY,8X,3HPSI,8X,2HUD,7X,3HTHD,8X,2HED,8X,3HRHO,
     X  8X,3HXLN//)
      DO 200  IJ=1,NPD
      IF(XPRN(I).GT.0) WRITE (6,210) IJ,Y(IJ),PSI(IJ),UD(IJ),THD(IJ),
     * ED(IJ),RHO(IJ),XLN(IJ)
  210 FORMAT(1X,I3,F11.5,E11.4,F9.6,F10.6,3E11.4)
      IF(IJ .EQ. JEND)  WRITE(6,215)
  215 FORMAT(/)
  200 CONTINUE
      WRITE (4) JREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,ED,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,JD

 1000 CONTINUE

      RETURN
      END
```

```
*DECK LSPFIT
      SUBROUTINE LSPFIT(X,Y,NPTS, XC,YC,NXC,ND)
*LSPFIT          INTEGRATE OR INTERPOLATE                          "LSPFIT"
C     INTEGRATE OR INTERPOLATE USING A PARABOLA WHICH PASSED THROUGH THE ITH
C     AND (I+1) POINTS BUT MISSES THE (I-1) AND (I+2) POINTS (IF THEY BOTH
C     EXIST) SUCH THAT THE SQUARE OF THE DEVIATION IS A MINIMUM.  NOTE
C     THAT  I  IS GENERALLY SELECTED SUCH THAT
C                X(I).LE.XC.LT.X(I+1)
C     THE EQUATION FOR THE PARABOLA IS
C                Y-Y(I) = B*(X-X(I)) + C*(X-X(I))**2

      DIMENSION X(10),Y(10), XC(10),YC(10)
C      NOTE. THE DIMENSION "10" DOES NOT NEED TO AGREE WITH THE CALLING PROGRAM

C     INPUT-
C     X, Y      PTS. ON CURVE
C     NPTS      NO. OF X
C     XC        LIST OF X AT WHICH CALC TO BE DONE
C     YC(1)     INTEGRATION CONSTANT IF  ND=-1
C     NXC       NO. OF XC
C     ND        =0 TO GET COORD,  =1 TO GET 1ST DERIVATIVE,
C               =-1 FOR INTEGRATION
C     LEND    = LINEAR FIT IN END INTERVAL, T OR F

C     OUTPUT
C     YC        COORDINATE OR DERIVATIVE AT XC     OR
C               YC(IC)= INTEGRAL(Y*DX) FROM XC(1) TO XC(IC) WHERE IC=2,NXC

C     NOTES-
C     "X" MAY BE IN EITHER ASCENDING OR DESCENDING ORDER.
C     FOR INTEGRATION "XC" MUST BE IN THE SAME ORDER AS "X".  FOR INTERPOLATION
C        NO SPECIAL ORDER IS REQUIRED.

      COMMON /CLSPF / I,LEND
       LOGICAL           LEND

      LOGICAL          WITHIN
      DATA KNAME/6HLSPFIT/

      N      = NPTS-1
      IF(ND.EQ.(-1)) I=1
      ISAVE = 0
      SGN    = SIGN(1.,X(N+1)-X(1))

C     BEGIN INTERPOLATION LOOP FOR XC(IC)  IC=1,NXC
      IC     = 1

C     LOCATE APPROPRIATE INTERVAL
  100 I      = MAX0(1,MIN0(I,N))
      WITHIN= .FALSE.
      NCOUNT= N
  102 IF(NCOUNT) 119,103,103
  103 NCOUNT= NCOUNT-1

      XI     = X(I)
      XD     = XC(IC)-XI
```

```
      IF(N) 104,120,104
  104 IF(SGN*XD) 105,107,110

C       F.LT.0. (F IS THE FRACTIONAL POSITION IN THE INTERVAL)
  105 IF(I.EQ.1)       GO TO 120
      IF(ND.EQ.(-1)) GO TO 119
      I     = I-1
      GO TO 102

C       F.EQ.0
  107 IF(X(I+1).NE.XI) GO TO 120
      IF(I.GE.N) GO TO 105
      GO TO 116

C       F.GT.0.
  110 IF(SGN*(XC(IC)-X(I+1))) 120,112,114

C       F.EQ.1.0.  CHECK FOR INTEGRATION AND DOUBLE POINT BEFORE INCREMENTING
  112 IF((ND.EQ.(-1)) .OR. (I.NE.N .AND. X(I+1).EQ.X(I+2))) GO TO 120

C       F.GT.1.0
  114 IF(I.EQ.N) GO TO 120
      IF(ND.EQ.(-1)) GO TO 122
  116 I     = I+1
      GO TO 102


C     PRELIMINARY CALCULATIONS FOR INTERPOLATION OR INTEGRATION
  120 WITHIN=.TRUE.
  122 IF(I-ISAVE) 124,129,124
  124 ISAVE = I
      YI    = Y(I)
      X3    = X(I+1)-XI
      Y3    = Y(I+1)-YI
      C     = 0.
      TOP   = 0.
      BOT   = 0.
      IF(LEND .AND. (I.EQ.1 .OR. I.EQ.N)) GO TO 128
      IF(I.LE.1) GO TO 127
      X1    = X(I-1)-XI
      X13   = X(I-1)-X(I+1)
      TOP   = X1*(Y3*X1-(Y(I-1)-YI)*X3)*X13
      BOT   = X1*X1*X13*X13*X3
  127 IF(I.GE.N .OR. (XD.EQ.0..AND.BOT.NE.0.)) GO TO 128
      X4    = X(I+2)-XI
      X43   = X(I+2)-X(I+1)
      Y4    = Y(I+2)-YI
      TOP   = TOP + X4*(Y3*X4-Y4*X3)*X43
      BOT   = BOT + X4*X4*X43*X43*X3
  128 IF(BOT.NE.0.) C = -TOP/BOT
      B     = 0.
      IF(N.GT.0 .AND. X3.NE.0.) B = (Y(I+1)-YI)/X3 - C*X3
  129 IF(ND) 130,140,141

C     ND=-1, INTEGRATE
```

```
  130 IF(.NOT.WITHIN) XD=X3
      S1     = (YI + (B/2. + C/3.*XD)*XD)*XD
      IF(WITHIN) GO TO 135
C     "I" IS BEING INCREMENTED TO FIND APPROPRIATE INTERVAL.  HENCE,
C      CUMULATE THE INTEGRAL OF THE ITH INTERVAL.
      SA     = SA + S1
      GO TO 116
C     APPROPRIATE INTERVAL FOUND,    X(I)-XC(IC)-X(I+1)
  135 IF(IC.EQ.1) SA=YC(IC)-S1
      IF(IC.NE.1) YC(IC)=SA+S1
      GO TO 150

C     ND=0,  INTERPOLATE FOR COORDINATES
  140 YC(IC)= YI + (B + C*XD)*XD
      GO TO 150

C     ND=1,  FIRST DERIVATIVE
  141 YC(IC)= B + 2.*C*XD
      GO TO 150

  150 IC     = IC+1
      IF(NXC-IC) 900,160,160
  160 IF(ND.NE.(-1).AND.XC(IC).EQ.XC(IC-1)) I=I+1
      GO TO 100

  900 RETURN
      END
```

```
*DECK NOISE
      OVERLAY(SSNOISE,4,0)
      PROGRAM NOISE

C     MAIN-- NOISE OVERLAY (4,0)

      COMMON /TROUBL/ ERR,ENDJOB
      LOGICAL          ERR,ENDJOB
      COMMON /CNERR / BITS,CERR,DUM1(3)
      LOGICAL               CERR

    1 CALL MAINNS
      IF( .NOT.CERR ) GO TO 20
   10 ERR    = .TRUE.
   20 RETURN
      END
```

```
*DECK BLK11
      BLOCK DATA
      COMMON /NOIS11/ JETTM,LIGHTH,AFAC,YFAC(96),XFAC(48),
     * ZFAC(96),THMAX(96),FRQ(48),NFRQ,NEARFD,BETAIN,QCONV
      DATA NFRQ,FRQ/24,224.,282.,355.,447.,563.,709.,892.,
     X  1120.,1410.,1780.,2240.,2820.,3550.,4470.,5630.,7090.,8920.,
     * 11200.,14100.,17800.,22400.,28200.,35500.,44700.,
     * 56.3,70.9,89.2,112.,141.,178.,
     X  224., 282., 355., 447., 563., 709., 892.,
     X  1120.,1410.,1780.,2240.,2820.,3550.,4470.,5630.,7090.,8920.,
     X  11200./
      DATA THMAX/9*0.,3*20.,3*30.,3*40.,6*50.,24*70./
      DATA XFAC/6*1.,9*20.,3*40.,6*200.,9*20.,6*40.,9*200./
      DATA YFAC/3.18,2.95,1.45,1.49,1.63,.60,
     X  .91,.37,.16,15*0.,
     X  3.18,2.95,1.45,1.49,1.63,.60,.91,.37,.16,.29,.40,.65,.93,1.03,
     * 1.42,1.44,1.44,3.21,2.93,2.63,2.52,2.92,2*1.91,1.,.18,.53,
     * 21*0.,
     X 1., .18, .53, 1.4, 1.65, 1.9, 1.5, 3.3, 2.1, 2.5, 2*1.4, .57,
     X .54,.468,.456,.446,.144,.75,.96,1.2,1.5,1.89,2.37/
      DATA ZFAC/7.94,7.38,3.63,3.72,4.07,1.51,
     X  1.30,.53,.40,5.57,7.56,12.4,12.05,13.4,18.4,15.8,15.9,35.3,
     X  30.3,27.2,26.1,30.1,19.8,19.8,
     X  7.94,7.38,3.63,3.72,4.07,1.51,1.30,.53,.40,.977,1.326,2.175,
     * 3.09,3.43,4.73,4.79,4.81,10.7,9.77,8.76,8.41,9.72,2*6.38,
     * 2.,.36,1.05,9.5,11.2,12.9,10.2,
     X  22.1,14.3,16.7,9.35,9.25,5.4,5.16,4.5,4.4,5.28,1.39,7.25,9.28,
     X  11.6,14.5,18.3,22.9,
     X 2.,.36,1.05,2.8,3.3,3.8,3.,6.5,4.2,4.9,2.75,2.8,1.86,1.87,1.56,
     X 1.52,1.82,.48,2.5,3.2,4.,5.,6.3,7.9/
      END
```

```
*DECK INTERP
      SUBROUTINE INTERP(X,Y)
*INTERP
      DIMENSION XTABLE(20), YTABLE(20)

      DATA XTABLE/ -5., -.1, -.08, -.06, -.04, -.02, 0., .02, .04, .06,
     X  .08, .1, .2, 100., 6*200. /
      DATA YTABLE/ .69, .69, .708, .76, .785, .866, 1.01, 1.17,1.29,1.46
     Y ,1.75, 2., 8*3.75 /
    5 FORMAT(//4H   X=,E15.8, 30H   IS OUTSIDE RANGE OF X TABLE.     )

      N=14
      IF (X-XTABLE(1)) 120,50,70
   50 Y=YTABLE(1)
      GO TO 180

   70 IF(XTABLE(N)-X) 120,75, 75
   75  DO 110 I=2,N
       IF(X-XTABLE(I)) 140,  90, 110
   90 Y=YTABLE(I)
      GO TO 180
  110 CONTINUE

  120 WRITE(6,5) X
      GO TO 180

  140 I1=  I- 1
      B=YTABLE(I1)
      A=(YTABLE(I)-B)/(XTABLE(I)-XTABLE(I1))
      Y=A*(X-XTABLE(I1)) + B
  180 RETURN
       END
```

```
*DECK JTFILN
      SUBROUTINE JTFILN (NTRY,XX)
CJTFILE         STORAGE OF AERO-DATA FILE FOR PLOT OR NOISE
      LOGICAL   ENTRYI
      LOGICAL FOUND
      LOGICAL MCHANG
      LOGICAL AMBTO
      LOGICAL DPRIN
      LOGICAL  EOF  ,  ERR
      LOGICAL  AXI , XPRN , CMPRS , GJET , TURBJ , CORE
      LOGICAL ENTRY1
      REAL  MJET , ME , MUREF
      REAL MACH
      REAL  MOLF1(200),MOLF2(200),MOLF3(200),MOLF4(200),MOLF5(200),
     *       MOLF6(200)
      COMMON /RSTART/ NREG,RESTRT,NRES,MIXPRE
      LOGICAL  MIXPRE
      COMMON /CTRL2/ TWODT(9)
      COMMON /DIFEQI/
     * NC , CNAME(6) , ALJ(6) , ALJO(6) , ALE(6) ,
     * SCM(6) , TCPRF(6) , HCPRF(6) , CPC(3,6)
      COMMON /DICTRL/ DIFF , CND(10)
      LOGICAL           DIFF
      COMMON /MOLES/ ALX(200,6)
      COMMON /BCMOL/ ALEDGE(6),  ALO(6)
      COMMON /FILES/ ORGF,UPDF,NEWF,SCRF
      COMMON /FILK/  CSC
      COMMON /PARAM/
     * U(200),T(200),TOT(200),XMACH(200),PTOT(200),TTD(200),
     * PTD(200),DUMP9(409)
      COMMON /RATIO/   AMBTO
      COMMON /MISC/ PM(10),  PLOT
      COMMON /INP1/ ENTRY1
      COMMON /UMESH/ MCHANG,CK,DY1,NMSH       , CXPC,CXTP,NRED
C*
C****** INPUT COMMON
C*
      COMMON /INPJET/
     * DIAJ        , MJET        , TJET        , PTJET       , VJET        ,
     * TIJET       ,
     * PE          , VE          , ME          , TIE         , TE          ,
     * AXI         , NJ          , NM          ,
     * X(100)      , XPRN(100)   ,
     * GAM         , RG          , PR          , PRT         ,
     * SC          , TREF        , MUREF
C*
C****** CONSTANT AND ERROR COMMON
C*
      COMMON /CNERR/ BITS , ERR , GC , GCJ , FOOT
C*
C****** BOUNDARY CONDITION COMMON
C*
      COMMON /BC/ UEDGE  , EEDGE  , THEDGE
C*
C****** POTENTIAL CORE COMMON
C*
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```
      COMMON /CORED/ XCORE  , CORE  , CORSTP
C*
C****** SCALER (UNITS CONVERSION) COMMON
C*
      COMMON /SCALER/  SP  , SV  , SLEN
C*
      COMMON /JET1/ FLOWJ,TT0,NX,EJET
      COMMON /PROPJT/
     * P        , PRL      , PRTT     , RGAS     , SCC      ,
     * TREF     , VSREF    , MACH     , XLC      ,
     * REFL,C,CHI,RNORM,
     * RHO(200),DUM13(600),XLN(200),DUM14(400)
      COMMON /XPRIN/ DPRIN
      COMMON /FDATA/  DUM7(4),NFCSV,NRW
      COMMON /CPROP/ CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8  ,CT9,CT10
      COMMON/ PROF/ PSI(200),Y(200),UD(200),THD(200),ED(200)
      COMMON /JET/
     * B(100),UC(100),TC(100),TIC(100),
     * PTC(100),WJ(100),YJ(100),YSONIC(100)
      COMMON /JET2/ TTC(100)
      COMMON /CTRL/
     * NXTA        , CMPRS       , QJET        , TURBJ       , COEF(10)   ,
     * NPU  ,  NPD  , DXC  , XU  , XDD  ,
     * TID(200)      , DSTOR(600)
      COMMON /TAG/
     * NAME(10),TITLE(10),IDENT(10),ADDRES(10),IDENT1(10)
C*
      COMMON /MIXER/ MIX,RD(100),XD(100),CF,YR(100)
      LOGICAL  MIX
      COMMON /FLOBAL/ MAXIT,SUPB,NIT,PSID,YDD,YDC,
     *                  P1,P2,UCL,TOL,UPSTRM,CVG
      LOGICAL  SUPB,CVG,UPSTRM
      COMMON /ACONVG/ YCD(100),PD(100),INDC(100),  CHOKE, CHOKED
      LOGICAL  CHOKE, CHOKED
      COMMON /DFIT/  CLSP(100)
      COMMON /STA2/ MACH2,TS2,SS2,V2,RHO2,DPDX2
      REAL  MACH2
      COMMON /BCMIX2/ GRADU,TW,MUW,RHOW,PTE,TTE
      REAL  MUW
      COMMON /MIXPRP/ MA2(100),VE2(100),TE2(100),TWC(100)
      REAL MA2
      COMMON /THRST/ WV(100)
      COMMON /OUTMIX/ NXORIG
      COMMON /CBODY/  YCB(100),CLSPCB(100),YCB1 , UCL1
      COMMON /JET3/STADD,NV,STATF
      COMMON /KEYS/ KEY(11),KEYB(11),KODA(11),KODB(11)
      COMMON /MERGET/ MER,MERSTP,XMRG
      COMMON /SUPER/ SUPC,SUPSTP,XSUP
      COMMON /CPROP2/ CTP,CTS,CTM
      COMMON /PROPJ2/ MACHO,REFLO,YI,YO,MERGE
      COMMON /CONSTF/ CON1
      COMMON /FILINO/ KREC,KXX
C*
      EQUIVALENCE (MOLF1(1),ALX(1))     , (MOLF2(1),ALX(201))  ,
     *            (MOLF3(1),ALX(401))   , (MOLF4(1),ALX(601))  ,
     *            (MOLF5(1),ALX(801))   , (MOLF6(1),ALX(1001))
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```
      COMMON /CMFILE/ MFILE
C*
      DIMENSION  LEN2(11),NS2A(10),LEN1(5),NSA(4)
      EQUIVALENCE  (UE,VE)
      EQUIVALENCE (C6,COEF(6))
      DATA  ENTRYI/T/
      DATA NSA/15,1HJ,6,1HJ/
      DATA NS2A/5,2HII,1,2HIL,11,1HI,10,2HIJ,5,2HJK/
      DATA IBLANK/0202020202020/
      DATA IPROF/5HAPROF/
      DATA KXX1/2HXX/
C*
C*
C*
    1 GO TO (120,200 ) , NTRY

  120 REWIND MFILE
      READ (MFILE ) KXX1,KREC,
     * NAME,TITLE,IDENT,ADDRES,IDENT1,
     * TWODT  ,
     * BITS,ERR,GC,GCJ,FOOT,
     * DIAJ,MJET,TJET,PTJET,VJET,TIJET,EJET,
     * PE,VE,ME,TIE,TE,AXI,NJ,NM,
     * UE,MIXPRE,XLC,FLOWJ,MERGE,NV,CON1,
     * CT1,CT2,CT3,CT4,CT5,CT6,CT7,CT8,CT9,CTP,CTS,CTM,
     * GAM,RG,PR,PRT,SC,TREF,MUREF,SP,SV,SLEN,DPRIN,PLOT,
     *C6,MIX,CF,MAXIT,TOL,SUPB ,
     *X,XPRN,B,UC,TC,TIC,PTC,WJ,YJ,TTC,
     * YSONIC  ,
     *YCB,XD,RD,YR,YCD,PD,WV,MA2,VE2,TE2,NXTA,I,
     *NC,CNAME,ALJ,ALJO,ALE,SCM,DIFF
      GO TO 1000

  200 KRES   = CSC*XX+.5
      DO 210 IJ=1,KREC
      READ (MFILE) JREC,KXX,KREG,SUPD,SUPSTP,CORE,CORSTP,MER,MERSTP,
     * NPD,PSI,Y,UD,THD,ED,TID,RHO,XLN,
     * U,T,TOT,XMACH,PTOT,TTD,PTD,MOLF1,MOLF2,MOLF3,MOLF4,MOLF5,MOLF6,J
      IF( KXX.EQ.KRES ) GO TO 1000
  210 CONTINUE
      ERR    = .TRUE.
      WRITE (6,211) XX
  211 FORMAT(1H1,//2X,10HSTATION X=,F10.6,2X,11HNOT ON FILE//)

 1000 RETURN
      END
```

```
*DECK MAINNS
      SUBROUTINE MAINNS
CMAINNS         MAIN SUBROUTINE*** NOISE

      LOGICAL PAO,PSPEC
      LOGICAL HOTJET,BETAIN,QCONV,RIBNER,LILLEY
      LOGICAL STAPE,IPUNCH,ENDJOB
      INTEGER S1(5),S1ID(2),SP(5),SPID(2),BLANK
      EQUIVALENCE (S1,SP), (S1ID,SPID)
      DIMENSION KEY(11)
      REAL LSCALE
      COMMON/XLNFAC/LSCALE
      COMMON DUMC(8),PROGSV,DUMJ(2),KEYREF
      COMMON /FILK/CSC
      COMMON/CUPDAT/MAP,IMAP,NDIGIT(14)
      COMMON/ADAM02/ENDJOB
      COMMON/CORED/XCORE,CORE,CORSTP
      COMMON/CARRY/NEW
      LOGICAL NEW,ERR
      COMMON/CNERR/SBITS,ERR,DUM40(3)
      LOGICAL BAND3,ACOUSP,ACSPAN,ARC
      COMMON/CBITS/BITS,BLANK
      COMMON/CFILE/NFOPEN,ORDER,ORIG,UPDAT
      LOGICAL NFOPEN
      COMMON/NOISE1/NOISEC,ASPEED,NA,SLINE,ANGJ(20),PSUM2(20),
     X  OASPL(20),PREFN,BAND3
      COMMON/NOISE4/BETA
      COMMON/NOISE6/ACOUSP(100),ACSPAN(20)
      COMMON/NOISE7/SCALJ,CVMACH,SCALT,RIBNER,CRIB,LILLEY,SE,PAO,MU
     X  ,PSPEC
      COMMON/NOIS10/ARC,ARCL,MC
      COMMON/NOIS11/JETTEM,LIGHTH,AFAC,YFAC(24,2,2),XFAC(24,2),
     X  ZFAC(24,2,2),THMAX(24,2),FRQ(24,2),NFRQ,NEARFD,BETAIN,QCONV
      EQUIVALENCE (HOTJET,JETTEM)
      COMMON/NOIS12/TSPL(36,20),IPUNCH
      COMMON /CMFILE/ MFILE

*NOISE INPUT LIST
      NAMELIST/  A  /ARC,ARCL,MC,BETA,CVMACH,SCALT,ACOUSP,ACSPAN,RIBNER,
     X  CRIB,SLINE,ANGJ,NA,PREFN,BAND3,SCALJ,JETTEM,LIGHTH,
     X  AFAC,YFAC,XFAC,ZFAC,THMAX,NFRQ,FRQ,NEARFD,XCORE,
     X  S1,S1ID,SP,SPID,IPUNCH,STAPE,CSC,NDIGIT,HOTJET,BETAIN,QCONV
     X  ,LILLEY,SE,PAO,MU,PSPEC,LSCALE
     * ,MFILE
      NAMELIST/SLIST/TSPL

*INITIALIZE NOISE DATA
      BETAIN= .FALSE.
      NEARFD= 0
      PAO   = .FALSE.
      PSPEC = .FALSE.
      MU    = 0
      JETTEM= 0
      QCONV = .FALSE.
      RIBNER= .FALSE.
      LILLEY= .FALSE.
```

```
      MFILE = 2
      LSCALE=1.
      CALL SETM(1,0,ACOUSP,120)
      ARC=.FALSE.
      ARCL=BITS
      SE=1.
      SCALT=.5
      SCALJ=1.
      CVMACH=.63
      CRIB=.2577
      RIBNER=.FALSE.
      PREFN=.0002
      DO 10  I=1,5
   10 S1(I)=0
      DO 15  I=1,2
   15 S1ID(I)=BLANK

      CALL NOISEM

      RETURN
      END
```

```
*DECK NOISEM
      SUBROUTINE NOISEM
CNOISEM         FAR FIELD ANALYSIS FOR JET

      DOUBLE PRECISION ASQST,BST
      LOGICAL DBUG
      LOGICAL PAO,PSPEC
      LOGICAL RIBNER,LILLEY
      LOGICAL ENTRY1
      LOGICAL NOISEC
      LOGICAL BETAIN,QCONV
      LOGICAL ACOUSP,ACSPAN
      LOGICAL BAND3
      LOGICAL         TAPIN,TAPOT
      REAL K01,K02,K11,K12
      REAL INTG1,INTG2
      REAL MLOC,MACH,MCENT,MQ1,MQ2,MCMA,MRAT
      DIMENSION W(200),MLOC(200),A(200),UOVC(200)
      DIMENSION BTAB(26),FOFB(26)
      REAL JSUB1
      REAL   MJET,ME,MUREF
      LOGICAL AXI,XPRN,CMPRS,QJET,TURBJ,ERR
C*
      REAL LSCALE
      COMMON/XLNFAC/LSCALE
      COMMON /NOISE1/
     * NOISEC,ASPEED,NA,SLINE,ANGJ(20),PSUM2(20),OASPL(20),
     * PREFN,BAND3
      COMMON/NOISE2/PIJ(200),SPLIJ(200),FREQIJ(200),PIJ2(200),
     X  SPLIJ2(200),FRQIJ2(200)
      COMMON/NOISE3/FL(36),FC(36),FU(36),IN(36),PIJ13(36),IN1(36),
     X  PIJ131(36),IN2(36),PIJ132(36)
      COMMON /NOISE4/ BETA
      COMMON /NOISE5/  PNDB(20),  SPLOC(8,20)
      COMMON /NOISE6/ ACOUSP(100),ACSPAN(20)
      COMMON/NOISE7/SCALJ,CVMACH,SCALT,RIBNER,CRIB,LILLEY,SE,PAO,MU
     X  ,PSPEC
      COMMON /NOISE8/APOWER,POW(100),POWTOT,SPOW(200)
      LOGICAL  APOWER
      COMMON /NOISE9/ INP(36),POW3(36)
      COMMON/NOIS10/ ARC,ARCL,MC
      LOGICAL  ARC
      COMMON/NOIS11/JETTEM,LIGHTH,AFAC,YFAC(24,2,2),XFAC(24,2),
     X  ZFAC(24,2,2),THMAX(24,2),FRQ(24,2),NFRQ,NEARFD,BETAIN,QCONV
      LOGICAL IPUNCH
      COMMON/NOIS12/TSPL(36,20),IPUNCH
C*
      COMMON /IOFILE/ TAPIN,TAPOT
      COMMON /TAG/ NAME(10),TITLE(10),IDENT(10),ADDRES(10),IDENT1(10)
      COMMON /INPJET/
     * DIAJ        , MJET        , TJET        , PTJET       , VJET        ,
     * TIJET       ,
     * PE          , VE          , ME          , TIE         , TE          ,
     * AXI         , NJ          , NM          ,
     * X(100)      , XPRN(100)   ,
     * GAM         , RG          , PR          , PRT         ,
```

```
      * SC             , TREF          , MUREF
       COMMON /CTRL/
      * NXTA           , CMPRS         , QJET          , TURBJ         , COEF(10)     ,
      * NPU            , NPD           , DXC           , XU            , XD           ,
      * U(200)         , TKE(200)      , T(200)        , R(200)
       COMMON /CNERR/ BITS,ERR,GC,GCJ,FOOT
       COMMON /PROF/ PS1(200),YD(200),UD(200),THD(200),ED(200)
       COMMON /JET1/ DUM1(3),    EJET
       COMMON/PROPJT/DUMP12(8),XCORE1,DUM12(4),
      * RHO(200),DUM13(600),XLN(200),Y(200),DUM14(200)
       COMMON /CORED/ XCORE  , CORE  , CORSTP
       COMMON/JET/BMIX(100),DUM15(700)
       COMMON/CENTRY/ NA1,XS,ANGJJ
       DIMENSION  VOLJ(200)
       EQUIVALENCE  (VOLJ(1),DUM14(1))
       EQUIVALENCE (YA,SLINE), (C6,COEF(6))
       DATA PI/3.1415927/
       DATA RADDEG/.017453/
       DATA BTAB/0.,.13,.28,.51,.73,1.03,1.45,1.74,2.05,2.29,2.5,3.0,
      X  3.5,4.0,4.5,5.0,5.5,6.0,6.5,7.0,7.5,8.0,8.5,9.0,9.5,10.0/
       DATA FOFB/.66455,.453,.29667,.16087,.09314,.04675,.01959,.011375,
      X  .006652,.004518,.0032795,.0016258,.0008676,.0004923,.0002941,
      X  .0001836,.00011895,.0000796,.00005478,.00003864,.00002785,
      X  .00002047,.0000153,.00001162,.000008945..00000697/
       CTHP2(X)=.99939*X-.0349*SQRT(1.-X*X)
       CTHM2(X)=.99939*X+.0349*SQRT(1.-X*X)
       CTHP2(X)=.99939*X-.0349*SQRT(1.-X*X)
       F1(X)=(2.*UF1+(1.-UF1)*X)/(UF1*SQRT(X*X+UF1))
       F2(X,Y)=ALOG((X+SQRT(X*X+UF1))/(Y+SQRT(Y*Y+UF1)))
       F3(X)=(8.*UF1*(1.-2.*UF1)+(2.-12.*UF1+3.*UF1*UF1)*X-8.*UF1*X*X+UF1
      X  *X**3)/(2.*UF1*SQRT(X*X+UF1))
       AD(X)=SQRT(X*X+C*C)
       FI1(X)=X/AD(X)*(1./AD(X)**2+2./C**2)
       BX(X)=((1.-C**4+SN*CVM1**2)*X + 4.*C**4)/AD(X)
       DX(X)=BX(X)- ((C**4 -6.*C**2 +1.-SN*CVM1**2*(C**2-1.))*X**3
      1  +4.*C**4*(C**2-1.) -SN*2.*C**4*CVM1**2) /(3.*AD(X)**3)
       FI2(X)=DX(X) +ALOG(X+AD(X))*C**4
       FI3(X)=-DX(X)-ALOG(X+AD(X))*C**4
       B(X)=ABS (1.-CVM1*X)
       G1(X)=1./(4.*CVM1*B(X)**4)
       G2(X)=-1./CVM1**5*(ALOG(B(X)))+ 4./B(X)
       G3(X)= 1./CVM1**5*(ALOG(B(X)) + 4./B(X)
      1  -3./B(X)**2+4./(3.*B(X)**3)-1./(4.*B(X)**4))
      2  -1./CVM1**3*(-1./(2.*B(X)**2) + 2./(3.*B(X)**3) -.25/B(X)**4)
C*
C*  FAR FIELD NOISE CALCULATION---1 SIDE-LINE, UP TO 20
C*  RECEIVER ANGLES.    NA=OUTER LOOP INDEX ON ANGLES,  I=INNER LOOP
C*  INDEX ON X VALUES ALONG JET.  J=MESH POINT INDEX ON FLOW-FIELD.
C*
       APOWER=.FALSE.
       IF(NEARFD .LT. 1)  APOWER=.TRUE.
       IF(PAO)  APOWER=.FALSE.
       IF(BETAIN)  GO TO 5005
       BETA=.00425
       IF(JETTEM .NE. 0)  BETA=.002125
 5005 CONTINUE
```

```
      OSCALJ=1./SCALJ
      OSCALT=1./SCALT
      DYNES=478.8*478.8
      CALL JTFILN(1,DUMX)
      ASPEED=SQRT(GAM*GC*RG*TE)
      CX=2.*C6
      CPMP0=BETA/(4.*PI*ASPEED**4)
      PREFN2=1./(PREFN*PREFN)
      CTE=EJET*GCJ
      POWTOT=0.
      RHOE=144.*PE/(RG*TE)
      CPOW=.31*BETA/(RHOE*ASPEED**3*GC)
      CARC=1.
    1 NA1=0
    2 NA1=NA1+1
      IF(NA1.GT.1)  APOWER=.FALSE.
      ENTRY1=.TRUE.
      RANG=RADDEG*ANGJ(NA1)
      IF(ARC .AND. ARCL.EQ.BITS) CARC=1./SIN(RANG)**2
      IF(ARC .AND. ARCL.NE.BITS) SLINE=ARCL*SIN(RANG)
      ANG1=COS(RANG)/SIN(RANG)
      XA=YA*ANG1
C*
C*  INNER LOOP TO SWEEP FLOW FIELD FOR NOISE CALCULATIONS
C*
      PSUM=0.
      DO 100 I=1,NXTA
      SPOWS=0.
      XS=X(I)
      XSF=XS*CX
C*
C*  RECLAIM FLOW FIELD PROFILES FROM FILE  01
C*
    3 CALL JTFILN(2,XS)
C*
C*  CONVERT TO PHYSICAL VARIABLES
C*
      IF(I.EQ.1  .OR.  I.EQ.NXTA) GO TO 4
      DXA=.5*(X(I+1)-X(I-1))*CX
      GO TO 10
    4 IF(I.EQ.1) GO TO 6
      DXA=.5*(X(NXTA)-X(NXTA-1))*CX
      GO TO 10
    6 DXA=.5*(X(2)-X(1))*CX
C*
C*  INNER LOOP AT STATION I---J=SUBSCRIPT
C*
   10 CALL FMPYC(1,VJET,UD,U,NPD)
      CALL FMPYC(1,TJET,THD,T,NPD)
      CALL FMPYC(1,CTE,ED,TKE,NPD)
      CALL FMPYC(1,C6,YD,Y,NPD)
      IF(.NOT. PAO)  GO TO 7036

****************************************************************************

* PAO FAR FIELD NOISE MODEL
```

```
* CALCULATE MLOC AND A FOR EACH POINT
      COSA=COS(RANG)

      DO 7003  J=1,NPD
      A(J)=SQRT(GAM*GC*RG*T(J))/ASPEED
      MLOC(J)=U(J)/ASPEED
 7003 UOVC(J)=MLOC(J)/A(J)
      IF(COSA .EQ. 0.)  GO TO 7035

* SEARCH FOR POINT WHERE 1/(MLOC+A) = COS(ANGJ)
      COSI1=1./(MLOC(1)+A(1))
      DO 7005  J=2,NPD
      COSI2=COSI1
      COSI1=1./(MLOC(J)+A(J))
      IF((COSA .GE. COSI2  .AND.  COSA .LE. COSI1)  .OR.
     X  (COSA .LE. COSI2  .AND.  COSA .GE. COSI1))  GO TO 7010
 7005 CONTINUE
      J=NPD

* K IS THE INDEX OF THE Y VALUE THAT IS THE LOWER LIMIT FOR INTEGRAL
 7010 K=J
      IF(ABS(COSA-COSI2)  .LT.  ABS(COSA-COSI1))  K=J-1

* EVALUATE THE INTEGRAL W.  USE TRAPAZOIDAL RULE.
      W(K)=0.

      IF(K .EQ. NPD)  GO TO 7025
      DO 7020  J=K,NPD
      MQ2=MQ1
      MQ1=SQRT(ABS(((1./COSA+MLOC(J))/A(J))**2-1.))
      IF(J..EQ. K)  GO TO 7020
      W(J)=W(J-1)+.5*(Y(J)-Y(J-1))*(MQ1+MQ2)
 7020 CONTINUE

 7025 IF(K .EQ. 1)  GO TO 7035
      DO 7030  J1=1,K
      J=K-J1+1
      MQ2=MQ1
      MQ1=SQRT(ABS(((1./COSA+MLOC(J))/A(J))**2-1.))
      IF(J .EQ. K)  GO TO 7030
      W(J)=W(J+1)+.5*(Y(J)-Y(J+1))*(MQ1+MQ2)
 7030 CONTINUE
 7035 CONTINUE

***************************************************************************

 7036 DO 50 J=1,NPD
      XLN(J)=LSCALE*XLN(J)
      SS1=XSF-XA
      SS2=YA-Y(J)
      R(J)=SQRT(SS1*SS1+SS2*SS2)
      COSTH=-SS1/R(J)
      SINTH=SS2/R(J)
      THETA=ATAN2(SINTH,COSTH)*180./PI
      THM=1./(1.-ME*COSTH)
```

```
      FREQIJ(J)=1.1*SQRT(2.*TKE(J)/3.)/(2.*XLN(J)*PI)*OSCALJ
     * *OSCALT
      FREQIJ(J)=FREQIJ(J)*THM
      FRQIJ2(J)=FREQIJ(J)
C*
C*    EVALUATE VOLUME OF ANNULAR RING ASSOCIATED WITH POINT  IJ
C*
      IF(J.EQ.1 .OR.  J.EQ.NPD) GO TO 14
      DYA=.5*(Y(J+1)-Y(J-1))
      IF(DYA .EQ. 0.)  GO TO 20
      IF(Y(J+1) .EQ. Y(J))  GO TO 15
      IF(Y(J) .EQ. Y(J-1))  GO TO 16
      DU = (U(J+1)-U(J)) /(Y(J+1)-Y(J))
      DU= .5*(DU+(U(J)-U(J-1)) / (Y(J)-Y(J-1)))
      DUC=(UOVC(J+1)-UOVC(J))/(Y(J+1)-Y(J))
      DUC=.5*(DUC+(UOVC(J)-UOVC(J-1))/(Y(J)-Y(J-1)))
      GO TO 20
   15 DU=(U(J)-U(J-1))/(Y(J)-Y(J-1))
      DUC=(UOVC(J)-UOVC(J-1))/(Y(J)-Y(J-1))
      GO TO 20
   16 DU=(U(J+1)-U(J))/(Y(J+1)-Y(J))
      DUC=(UOVC(J+1)-UOVC(J))/(Y(J+1)-Y(J))
      GO TO 20
   14 IF(J.EQ.  1) GO TO 17
    . DYA=.5*(Y(NPD)-Y(NPD-1))
      IF(DYA .EQ. 0.)  GO TO 20
      DU =(U(NPD)-U(NPD-1)) / (Y(NPD)-Y(NPD-1))
      DUC=(UOVC(NPD)-UOVC(NPD-1))/(Y(NPD)-Y(NPD-1))
      GO TO 20
   17 DYA=.5*(Y(2)-Y(1))
      IF(DYA .EQ. 0.)  GO TO 20
      DU =(U(2)-U(1)) / (Y(2)-Y(1))
      DUC=(UOVC(2)-UOVC(1))/(Y(2)-Y(1))
   20 VOL=2.*PI*Y(J)*DXA*DYA
      VOLJ(J)=VOL

************************************************************************

* SPL CALCULATIONS

      IF(PAO)  GO TO 7000
C*    MC=0 FOR FIXED CM=CVMACH (INPUT)
C*    MC=1 FOR VARIABLE CM IN R-DIRECTION
      IF(MC .EQ. 1  .AND.  XS .GT. 1.)  GO TO 8010
      CM=CVMACH
       GO TO 8020

 8010 XY=(Y(J)-C6)/XSF
       CALL INTERP(XY,CM)

 8020 CVM1=CM*U(J)/ASPEED
      PAREN=1.-CVM1*COSTH
      UF1=.25*CVM1**2
      IF(JETTEM .EQ. 0)  UF1=.09*CVM1**2
      IF(.NOT. QCONV)  UF1=2.42/3.*TKE(J)/ASPEED**2
   30 IF(RIBNER .OR. LILLEY)  GO TO 32
```

```
   31 VEL22=U(J)**4
      VREL=ABS(U(J)-VE)
      VEL22=VREL**4*THM
      PAREN=PAREN*PAREN+UF1
      QFAC=(1.-CVM1**2)/SQRT(PAREN)
      C1=1./PAREN**2.5
      IF(NEARFD .GT. 0)  GO TO 38

************************************************************************

* FAR FIELD MODELS
      IF(LIGHTH .EQ. 1)  GO TO 140

* LIGHTHILL SELF NOISE
      PAREN=C1
      GO TO 33

* SELF AND SHEAR NOISE
  140 CXR=SINTH*SINTH*COSTH*COSTH/PAREN**1.5
      CXX=COSTH**4/PAREN**1.5
      JT=JETTEM+1
      STNUM=FREQIJ(J)*DIAJ/12./1116.
      DIVI=13392.
      IF(JETTEM .EQ. 1)  DIVI=293.7
      DO 34  L=1,NFRQ
      IF(STNUM .LT. FRQ(L,JT)/DIVI)  GO TO 36
   34 CONTINUE
      L=NFRQ
   36 CONTINUE
      ISUB=1
      IF(THETA .GE. THMAX(L,JT))  ISUB=2
      PAREN=ZFAC(L,ISUB,JT)*(CXR+CXX/XFAC(L,JT))+C1*YFAC(L,ISUB,JT)
      GO TO 33

************************************************************************

* NEAR FIELD MODELS (NEARFD=1,2,3 USE SAME MODEL FOR ENTIRE FLOW FIELD.
*                    NEARFD=4,5 ARE COMBINED MODELS.)
   38 IF(TKE(J) .EQ. 0.)  GO TO 33
      FAC=(ASPEED*XLN(J)/R(J)/1.1)**2*3./2./TKE(J)
      IF(NEARFD .LT. 4)  GO TO 108

* SIMILAR REGION - USE ISOTROPIC MODEL
      IF(X(I) .LT. 2.*XCORE)  GO TO 105
      NRFD=1
      GO TO 109

* TRANSITION REGION - USE LATERAL QUADRUPLE FOR NEARFD=4,
*                     USE ISOTROPIC FOR NEARFD=5.
  105 IF(X(I) .LT. XCORE)  GO TO 106
      NRFD=2
      IF(NEARFD .EQ. 5)  NRFD=1
      GO TO 109

* MIXING REGION
```

```
  106 IF(UD(J) .GT. .99999)  GO TO 107
* OUTSIDE CORE - USE LATERAL QUADRUPLE
      NRFD=2
      GO TO 109
* IN POTENTIAL CORE - USE ISOTROPIC MODEL
  107 NRFD=1
      GO TO 109

  108 NRFD=NEARFD
  109 GO TO (110,120,130), NRFD
*************************************************************************

* ISOTROPIC TURBULENCE MODEL
  110 PAREN=C1*(1.+2.*FAC+12.*FAC*FAC)
      GO TO 39

* LATERAL QUADRUPLE MODEL
  120 PAREN=C1*7.5*SINTH**2*(COSTH**2+FAC*(3.*QFAC**2*COSTH**2-6.*CVM1*
     X  QFAC*COSTH+4.*CVM1**2)+FAC**2*(9.*QFAC**4*COSTH**2-18.*CVM1
     X   *QFAC**3*COSTH+9.*CVM1**2*QFAC**2))
      GO TO 39

* LONGITUDINAL QUADRUPLE MODEL
  130 C2=1./PAREN**1.5
      PAREN=C2*(COSTH**4+FAC*(3.*QFAC**2*COSTH**4-12.*CVM1*QFAC*COSTH**3
     X  -COSTH**2*(4.-9.*CVM1**2)+6.*CVM1*COSTH+1.)+FAC**2*(9.*QFAC**4
     X  *COSTH**4-36.*QFAC**3*COSTH**3-6.*QFAC**2*COSTH**2*(1.-9.*
     X CVM1**2)+12.*QFAC*CVM1*COSTH*(1.-3.*CVM1**2)+(1.-3.*CVM1**2)**2))

   39 IF(CVM1 .LT. .1)  GO TO 33
      C=SQRT(UF1)
      X0=1.-CVM1
      X1=1.+CVM1
      JSUB1=(FI1(X1)-FI1(X0))/(3.*CVM1*C**2)
      PAREN=JSUB1/2.*PAREN
      GO TO 33

*************************************************************************

   32 IF(LILLEY)  GO TO 205
* RIBNER S METHOD
      VEL22=TKE(J)*(.25*CRIB*(COSTH**4+COSTH**2)*U(J)**2
     * +2.*SE*SQRT(2.)/3.*TKE(J))
      PAREN=PAREN*PAREN+UF1
      PAREN=1./PAREN**2.5*(8./27.)
      GO TO 33

* LILLEY MODEL
  205 VEL22= 2./3. * TKE(J) * DU**6 * (SINTH*COSTH)**2
      PAREN=PAREN*PAREN+UF1
      PAREN=1./PAREN**2.5
      PMP02=CPMP0*RHO(J)**2*VEL22*XLN(J)**5/(R(J)*GC)**2 *PAREN
      GO TO 35
```

```
*************************************************************************

   33 PMP02=CPMP0*RHO(J)**2*TKE(J)**2*VEL22/(XLN(J)*R(J)**2)*PAREN
     * /(GC*GC)
      GO TO 35

*************************************************************************

* PAO FAR FIELD NOISE MODEL

* DETERMINE THETA1, THETA2, THETA3
 7000 CTHET2=1./(MLOC(J)+A(J))
      MCMA=MLOC(J)-A(J)
      IF(ABS(MCMA) .GE. 1.0)  GO TO 7050
      IF(MCMA .GT. 0.)  MCMA=1.
      IF(MCMA .LT. 0.)  MCMA=-1.

 7050 IF(MCMA .LT. 0.)  GO TO 7060
      CTHET1=1./MCMA
      CTHET3=-1.
      GO TO 7065

 7060 CTHET3=1./MCMA
      C HET1=+1.
 7065 CONTINUE

      PMP02=0.
      PMP02P=0.
      TI=SQRT(2./3.*TKE(J))/VJET
      IF(TI .LT. 1.E-5)  GO TO 35
      MACH=VJET/ASPEED
      ALPHA=.3
      IF(JETTEM .NE. 0)  ALPHA=.5
      MCENT=.6*U(1)/ASPEED
      MRAT=MCENT/MACH
      QMQ0=A(J)**2*(1.-COSTH**2)/((1.-MLOC(J)*COSTH)**2-(A(J)*COSTH)**2)
      QMQ0=SQRT(ABS(QMQ0))
      IF(.NOT. PSPEC)  GO TO 7104
      XLNT=XLN(J)/(VJET*ALPHA)
      BMIX1=BMIX(I)
      IF(X(I) .GE. XCORE1)  BMIX1=BMIX1/2.
      XLNTD=XLNT*U(J)/BMIX1
      XLND=XLN(J)/BMIX1
      BST=MACH*W(J)*COSTH/CX
      IF(ANGJ(NA1) .EQ. 90.)  BST=0.
      ASQST=1./8.*((1.-MLOC(J)*COSTH)**2+(ALPHA*MLOC(J)*COSTH)**2)
     X' *XLNTD**2
      ST1=1./(4.*PI*ASQST)*(-BST+DSQRT(BST**2+8.*ASQST))
      ST2=1./(4.*PI*ASQST)*(-BST+DSQRT(BST**2+4.*ASQST))
      FREQIJ(J)=U(J)*ST1/CX
      FRQIJ2(J)=U(J)*ST2/CX
      OMEG1=2.*PI*ST1
      OMEG2=2.*PI*ST2
      OMEG01=OMEG1*(1.-MLOC(J)*COSTH)
      OMEG02=OMEG2*(1.-MLOC(J)*COSTH)
```

```
      K01=-MACH*OMEG01/A(J)
      K02=-MACH*OMEG02/A(J)
      K11=-MACH*OMEG1*COSTH
      K12=-MACH*OMEG2*COSTH

* DECIDE WHICH PAO MODEL TO USE
 7104 IF(COSA.GT.CTHM2(CTHET1)) GO TO 7130
      IF(COSA .GT. CTHP2(CTHET1))  GO TO 7110
      IF(COSA .GT. CTHM2(CTHET2))  GO TO 7120
      IF(COSA .GT. CTHP2(CTHET2))  GO TO 7110
      IF(COSA .GT. CTHM2(CTHET3))  GO TO 7100
      IF(COSA .GT. CTHP2(CTHET3))  GO TO 7110
      GO TO 7120

 7100 IF(PSPEC)  GO TO 7105
      PMP02=3.*SQRT(2.)*PI**1.5*TI**4*MACH**8*ALPHA**4/(R(J)**2*A(J)**2
     X  *XLN(J))*QMQ0*MRAT**4          *A(J)/(1.-MLOC(J)*COSTH)
     X  /SQRT(A(J)**2+(ALPHA*MCENT)**2)**5
      PMP02P=PMP02
      GO TO 7106
 7105 PMP02=PI*TI**4*MACH**8*XLNTD/(32.*R(J)**2*A(J)**6*XLND)*QMQ0
     X  *(OMEG01*XLN(J))**4/(1.-MLOC(J)*COSTH)*EXP(-1./8.*((K01*
     X  XLND)**2+(OMEG01*XLNTD)**2))
      PMP02P=PI*TI**4*MACH**8*XLNTD/(32.*R(J)**2*A(J)**6*XLND)*QMQ0
     X  *(OMEG02*XLN(J))**4/(1.-MLOC(J)*COSTH)*EXP(-1./8.*((K02*
     X  XLND)**2+(OMEG02*XLNTD)**2))
 7106 IF(MU.EQ.1) GO TO 7200
      GO TO 7150

 7110 OMEGA=ABS(ASPEED/VJET*DUC)
      IF(OMEGA .EQ. 0.)  GO TO 35
      AI0=.35503
      IF(COSTH .EQ. 0.)  COSTH=.0001
      IF(PSPEC)  GO TO 7115
      PMP02=160.*SQRT(2.)*PI**2*TI**4*MACH**8*AI0**2*ALPHA**(13./3.)
     X  *SINTH/COSTH/(9.*R(J)**2*A(J)**2*XLN(J)**(4./3.)*OMEGA**(1./3.))
     X  *1.355*ABS(COSTH)**(13./3.)           *MRAT**(13./3.)
     X  /((1.-MLOC(J)*COSTH)**2+(ALPHA*MCENT*COSTH)**2)**(8./3.)
      PMP02P=PMP02
      GO TO 7116
 7115 PMP02=PI**2*TI**4*MACH**8*XLNTD*AI0**2*SINTH/COSTH/(8.*R(J)**2*
     X  A(J)**2*XLN(J)**(4./3.)*OMEGA**(1./3.))
     X  *(OMEG01*XLND*COSTH)**(13./3.)/(1.-MLOC(J)*COSTH)**(16./3.)
     X  *EXP(-1./8.*((K11*XLND)**2+(OMEG01*XLNTD)**2))
      PMP02P=PI**2*TI**4*MACH**8*XLNTD*AI0**2*SINTH/COSTH/(8.*R(J)**2*
     X  A(J)**2*XLN(J)**(4./3.)*OMEGA**(1./3.))
     X  *(OMEG02*XLND*COSTH)**(13./3.)/(1.-MLOC(J)*COSTH)**(16./3.)
     X  *EXP(-1./8.*((K12*XLND)**2+(OMEG02*XLNTD)**2))
 7116 IF(MU.EQ.1) GO TO 7200
      GO TO 7150

 7120 IF(PSPEC)  GO TO 7127
      B1=2.*SQRT(2.)*MCENT*W(J)*ALPHA*COSTH/(XLN(J)*SQRT((1.
     X  -MLOC(J)*COSTH)**2+(ALPHA*MLOC(J)*COSTH)**2))
      B2=B1/SQRT(2.)
      IF(DBUG)
```

AD-A038 614 GENERAL ELECTRIC CO CINCINNATI OHIO AIRCRAFT ENGINE GROUP F/G 20/1
SUPERSONIC JET EXHAUST NOISE INVESTIGATION. VOLUME III. COMPUTE--ETC(U)
JUL 76 D R FERGUSON, M A SMITH, P R KNOTT F33615-73-C-2031
UNCLASSIFIED R74AEG452-VOL-3 AFAPL-TR-76-68-VOL-3 NL

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AD A038614

END
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```
      xPRINT 7993, J,B1,B2
 7993 FORMAT(3HS1B,I4,2E13.5)
      DO 7122  IJ=2,26
      IF(B1 .LE. BTAB(IJ))  GO TO 7123
 7122 CONTINUE
      IJ=26
 7123 FOFB1=10.**(ALOG10(FOFB(IJ-1))+(B1-BTAB(IJ-1))*
     X  (ALOG10(FOFB(IJ))-ALOG10(FOFB(IJ-1)))/(BTAB(IJ)-BTAB(IJ-1)))
      DO 7124  IJ=2,26
      IF(B2 .LE. BTAB(IJ))  GO TO 7125
 7124 CONTINUE
      IJ=26
 7125 FOFB2=10.**(ALOG10(FOFB(IJ-1))+(B2-BTAB(IJ-1))*
     X  (ALOG10(FOFB(IJ))-ALOG10(FOFB(IJ-1)))/(BTAB(IJ)-BTAB(IJ-1)))
      PMP02P=3.*SQRT(2.)*PI**1.5*TI**4*MACH**8*ALPHA**4/(R(J)**2*A(J)**2
     X *XLN(J))*QMQ0*MRAT**4*        COSTH**4          /SQRT((1.-MLOC(J)
     X   *COSTH)**2+(ALPHA*MCENT*COSTH)**2)**5
      PMP02=PMP02P*FOFB1/FOFB(1)
      PMP02P=PMP02P*FOFB2/FOFB(1)
      GO TO 7128
 7127 PMP02=PI*TI**4*MACH**8*XLNTD/(32.*R(J)**2*A(J)**2*XLN(J))*QMQ0
     X                    *(OMEG01*XLND*COSTH)**4/
     X   (1.-MLOC(J)*COSTH)**5*EXP(-1./8.*((K11*XLND)**2
     X   +(OMEG01*XLNTD)**2)-2.*ABS(W(J)*K11/CX))
      PMP02P=PI*TI**4*MACH**8*XLNTD/(32.*R(J)**2*A(J)**2*XLN(J))*QMQ0
     X                    *(OMEG02*XLND*COSTH)**4/
     X   (1.-MLOC(J)*COSTH)**5*EXP(-1./8.*((K12*XLND)**2
     X   +(OMEG02*XLNTD)**2)-2.*ABS(W(J)*K12/CX))
 7128 IF(MU.EQ.1) GO TO 7200
      GO TO 7150

 7130 PMP02=0.
      GO TO 35

* MU = 1, SELF NOISE    MU = 2, SHEAR NOISE    MU = 0, BOTH
 7150 IF(PSPEC)  GO TO 7200
      COSTH0=A(J)*COSTH/(1.-MLOC(J)*COSTH)
      IF(CTHET2 .LE. COSA)  COSTH0=1.
      EFAC    =XLN(J)**2*(COSTH0**4+COSTH0**2)/(2.*SQRT(2.)*(TI*VJET)**2
     X  *MACH**2)*DU**2
      PMP02P=PMP02P*EFAC

      IF(MU .EQ. 0)  GO TO 7155
      PMP02=PMP02P
      GO TO 7200
 7155 CONTINUE

 7200 PMP02=PMP02*(PE*144./GC)**2
      PMP02P=PMP02P*(PE*144./GC)**2

**********************************************************************

C*  COMPUTE    --- PIJ, SPLIJ

   35 PIJ(J)=CARC*PMP02*VOL*DYNES
      PIJ(J)=PIJ(J)/(1.-ME*COSTH)
```

```
      PIJ(J)=ABS(PIJ(J))
      IF(PIJ(J).NE.0.) GO TO 37
      SPLIJ(J)=0.
      GO TO 5500
   37 SPLIJ(J)=10.*ALOG10(PIJ(J)*PREFN2)
      IF(SPLIJ(J).LT.0.) SPLIJ(J)=0.
   40 PSUM=PSUM+PIJ(J)
C*
 5500 IF(.NOT. PAD)  GO TO 4961
      PIJ2(J)=CARC*PMP02P*VOL*DYNES
      PIJ2(J)=PIJ2(J)/(1.-ME*COSTH)
      PIJ2(J)=ABS(PIJ2(J))
      IF(PIJ2(J) .NE. 0.)  GO TO 5510
      SPLIJ2(J)=0.
      GO TO 4961
 5510 SPLIJ2(J)=10.*ALOG10(PIJ2(J)*PREFN2)
      IF(SPLIJ2(J) .LT. 0.)  SPLIJ2(J)=0.
      PSUM=PSUM+PIJ2(J)

****************************************************************************

* POWER CALCULATIONS

 4961 IF(.NOT. APOWER)  GO TO 50
      UF=2.*TKE(J)/3.
      CVM1=CVMACH*U(J)/ASPEED
      UF1=.25*CVM1**2
      IF(JETTEM .EQ. 0)  UF1=.09*CVM1**2
      IF(.NOT. QCONV)  UF1=2.42/3.*TKE(J)/ASPEED**2
      IF(ABS(U(J)-VE) .LT. 1.E-2)  GO TO 4971
      IF(.NOT.RIBNER  .AND.  .NOT.LILLEY  .AND.  LIGHTH .EQ. 1)
     X  GO TO 4965

      X0=1.-CVM1
      X1=1.+CVM1
      C=UF1
      C=SQRT(C)
      CC=(1.+C**2)**2.5
      BRIB= BETA/(2.*RHOE*ASPEED**5*GC)
      IF(LILLEY)  GO TO 210
      IF(RIBNER)  GO TO 8110

****************************************************************************

* LIGHTHILL FAR FIELD MODEL
      IF(ABS(CVM1-1.) .LE. .05)  GO TO 8005
      IF(CVM1 .GT. .1)  GO TO 8001
      IF(C .GT. .05)  GO TO 8005
      AI1=2./CC
      GO TO 8009
 8001 IF(C .GE. .05  .AND.  (CVM1 .GT. .15  .OR.  C .GT. .15)) GOTO 8005
      AI1=G1(1.)-G1(-1.)
      GO TO 8009
 8005 AI1=(FI1(X1)-FI1(X0))/(3.*CVM1*C**2)
 8009 SPOW(J)=(9./4.*BETA/2.)*RHO(J)**2*UF**2*U(J)**4
     X  /(ASPEED**5*RHOE*XLN(J)*GC)*AI1*VOL
```

```
      GO TO 4969

*****************************************************************************

* RIBNER MODEL
 8110 SPOW1=BRIB*RHO(J)**2*(2./3.*TKE(J))**3/XLN(J)
      SN=+1.
      IF(ABS(CVM1-1.) .LE. .05)  GO TO 8300
      IF(CVM1 .GT. .1)  GO TO 8190
      AI2=1.066667/CC
      IF(C .GT. .05)  GO TO 8350
      AI1=2./CC
      GO TO 8400
 8190 IF(C .GE. .05  .AND.  (CVM1 .GT. .15  .OR.  C .GT. .15))
     X  GO TO 8300
      AI1=G1(1.)-G1(-1.)
      AI2=G2(1.)-G2(-1.)
      GO TO 8400
 8300 AI2=(FI2(X1)-FI2(X0))/(CVM1**5*C**4)
 8350 AI1=(FI1(X1)-FI1(X0))/(3.*CVM1*C**2)
 8400 SPOW(J)=(SQRT(2.)*2./3.*TKE(J)*AI1*SE+CRIB/4.*U(J)**2*AI2)
     X  *SPOW1*VOL
      GO TO 4969

* LILLEY MODEL
  210 SPOW1=BRIB*RHO(J)**2*(2./3.*TKE(J))*DU**6*XLN(J)**5
      SN=-1.
      IF(ABS(CVM1-1.) .LE. .05)  GO TO 250
      IF(CVM1 .GT. .1)  GO TO 230
      AI3=.266667/CC
      GO TO 290
  230 IF(C .GE. .05  .AND.  (CVM1 .GT. .15  .OR.  C .GT. .15)) GO TO 250
      AI3=G3(1.)-G3(-1.)
      GO TO 290
  250 AI3=(FI3(X1)-FI3(X0))/(CVM1**5*C**4)
  290 SPOW(J)=AI3*SPOW1*VOL
      GO TO 4969

*****************************************************************************

* SELF AND SHEAR NOISE MODEL
 4965 JT=JETTEM+1
      STNUM=FREQIJ(J)*DIAJ/12./1116.
      DIVI=13392.
      IF(JETTEM .EQ. 1)  DIVI=293.7
      DO 4966  L=1,NFRQ
      IF(STNUM .LT. FRQ(L,JT)/DIVI)  GO TO 4967
 4966 CONTINUE
      L=NFRQ
 4967 CONTINUE
      COSTH1=COS(THMAX(L,JT)*PI/180.)
      X0=1.-CVM1
      X1=1.-CVM1*COSTH1
      X2=1.+CVM1
      TERM1=ZFAC(L,1,JT)/CVM1**3*(F1(X1)-F1(X0)+F2(X1,X0))
     X  +ZFAC(L,2,JT)/CVM1**3*(F1(X2)-F1(X1)+F2(X2,X1))
```

```
      TERM2=ZFAC(L,1,JT)/CVM1**5*(F3(X1)-F3(X0)+(6.-3./2.*UF1)*F2(X1,X0)
     X  )+ZFAC(L,2,JT)/CVM1**5*(F3(X2)-F3(X1)+(6.-3./2.*UF1)*F2(X2,X1))
      TERM3=(YFAC(L,1,JT)*
     X    (X1*(2.*X1*X1+3.*UF1)/(X1*X1+UF1)**1.5
     X   -X0*(2.*X0*X0+3.*UF1)/(X0*X0+UF1)**1.5)
     X   +YFAC(L,2,JT)*
     X    (X2*(2.*X2*X2+3.*UF1)/(X2*X2+UF1)**1.5
     X   -X1*(2.*X1*X1+3.*UF1)/(X1*X1+UF1)**1.5))
     X   /(3.*CVM1*UF1*UF1)
      SPOW(J)=BETA*RHO(J)**2*U(J)**4*TKE(J)**2/RHOE/ASPEED**5/XLN(J)
     X   /GC*VOL*.5*(AFAC*TERM1-AFAC*TERM2+AFAC*TERM2/XFAC(L,JT)+TERM3)
      GO TO 4969

************************************************************************

 4971 SPOW(J)=0.
 4969 IF(SPOW(J) .LT. 0.)  SPOW(J)=0.
      SPOWS=SPOWS+SPOW(J)
   50 CONTINUE
C*
C*   PERFORM  1/3 OCTAVE BAND ANALYSIS IF REQUESTED
C*
   70 CALL OCTAV3(NPD,ENTRY1)
      IF(.NOT. APOWER) GO TO 60
C*
C*   CONVERT TO PWL VALUES
C*
      DO 6922 L=1,NPD
      IF(SPOW(L).LE. 0.) GO TO 6921
      TERMPP=1.35581E+13*SPOW(L)/VOLJ(L)
      SPOW(L)=10.*ALOG10(TERMPP)
      GO TO  6922
 6921 SPOW(L)=0.
 6922 CONTINUE
   60 ANGJJ=ANGJ(NA1)
C*
C*   PRINT PROFILES OF YD,R,PIJ,SPLIJ,FREQIJ IF REQUESTED
C*
      IF(ACOUSP(I).AND.ACSPAN(NA1)) CALL NOISP
C*
      IF(.NOT.APOWER)GO TO 100
      IF(SPOWS .EQ. 0.)  GO TO 99
      POW(I)=10.*ALOG10(1.35581E+13*SPOWS/DXA*C6)
      POWTOT=POWTOT+SPOWS
      GO TO 100
   99 POW(I)=0.
  100 CONTINUE
C*   OVERALL PROPERTIES FOR GIVEN ANGLE
      PSUM2(NA1)=PSUM
      OASPL(NA1)=10.*ALOG10(PSUM *PREFN2)
C*
C*   COMPUTE OCTAVE FREQS SPLS--(USE 1/3 OCTAVE DATA
C*
      CALL OCTAV
C*
C*   SUM FOR OCTAVE FREQUENCY SPL CALCULATION
```

```
C*
C*
      DO 201 L=1,8
      IF(SPLOC(L,NA1).EQ.0.) GO TO 201
      SPLOC(L,NA1)=10.*ALOG10(SPLOC(L,NA1)*PREFN2)
  201 CONTINUE
C*
C*
C*  CONVERT BAND PIJS TO SPLS
C*
      DO 501 L=1,36
      IF(PIJ13(L).EQ.0.) GO TO 501
      PIJ13(L)=10.*ALOG10(PIJ13(L)*PREFN2)
      IF(PIJ13(L).LT.0.) PIJ13(L)=0.
  501 CONTINUE
      IF(.NOT. PAO)  GO TO 5600
      DO 5550  L=1,36
      IF(PIJ131(L) .EQ. 0.)  GO TO 5555
      PIJ131(L)=10.*ALOG10(PIJ131(L)*PREFN2)
      IF(PIJ131(L) .LT. 0.)  PIJ131(L)=0.
 5555 IF(PIJ132(L) .EQ. 0.)  GO TO 5550
      PIJ132(L)=10.*ALOG10(PIJ132(L)*PREFN2)
      IF(PIJ132(L) .LT. 0.)  PIJ132(L)=0.
 5550 CONTINUE
 5600 CALL PNOBC
      IF(.NOT.  BAND3) GO TO 500
      CALL PBAND3
  500 CALL JTFILN(1,DUMX)
      IF( NA1.LT.NA ) GO TO 2
C*  FINISHED--- PRINT OVERALL ACOUSTIC PROPERTIES AND 1/3
C*  OCTAVE BAND ANALYSIS
C*
  600 CALL NPRINO
      IF(NEARFD .GT. 0)  GO TO 1000
      IF(PAO)  GO TO 1000
      POWTOT=10.*ALOG10(1.35581E+13*POWTOT)
      DO 800 L=1,36
      IF(POW3(L).LE. 0.) GO TO 799
      POW3(L)=10.*ALOG10(1.35581E+13*POW3(L))
      GO TO 800
  799 POW3(L)=0.
  800 CONTINUE
      CALL PWPRNT
C*
 1000 RETURN
 7990 FORMAT(5D20.5)
      END
```

```
*DECK NPRINO
      SUBROUTINE NPRINO
CNPRINO          SUMMARY PRINT--OVERALL-- FAR FIELD NOISE
      LOGICAL PAO
      LOGICAL RIBNER,LILLEY
      LOGICAL IPUNCH
      DIMENSION PLTTIT(12)
      LOGICAL AXI,XPRN,CMPRS,QJET,TURBJ,NOISEC,BAND3
      REAL MJET,ME,MUREF
      COMMON/NOISE7/SCALJ,CVMACH,SCALT,RIBNER,CRIB,LILLEY,SE,PAO,MU
      COMMON/NOIS11/JETTEM,LIGHTH,DUMMY(338),NEARFO
      COMMON/NOIS12/TSPL(36,20),IPUNCH
      COMMON/NOISE3/SPCTRM(36,9)
      COMMON /NOISE1/
     * NOISEC,ASPEED,NA,SLINE,ANGJ(20),PSUM2(20),OASPL(20),PREFN,BAND3
      COMMON /INPJET/
     * DIAJ      , MJET       , TJET       , PTJET      , VJET      ,
     * TIJET     ,
     * PE        , VE         , ME         , TIE        , TE        ,
     * AXI       , NJ         , NM         ,
     * X(100)    , XPRN(100)  ,
     * GAM       , RG         , PR         , PRT        ,
     * SC        , TREF       , MUREF
      COMMON /TAG/NAME(10),TITLE(10),IDENT(10),ADDRES(10),IDENT1(10)
      COMMON /PROF/ PSI(200),Y(200),DUMPA(600)
      COMMON /CTRL/ NXTA,DUMCR(14),NPD,DUMCR1(603),R(200)
      COMMON /NOISE2/ PIJ(200),SPLIJ(200),FREQIJ(200),
     X  PIJ2(200),SPLIJ2(200),FRQIJ2(200)
      COMMON /CBITS/ BITS, BLANK
      COMMON /NOISE5/ PNDB(20)  ,  SPLOC(8,20)
      COMMON/NOISE8/APOWER,POW(100),POWTOT,SPOW(200)
      COMMON /CENTRY/ NA1,XS,ANGLE
      LOGICAL APOWER
      COMMON /NOISE9/INP(36),POW3(36)
      DATA NANG/0/
      DATA PLTTIT/10HSPL VS. FR,3HEQ.,8*1H ,3HSPL,4HFREQ/
C*
C*  SUMMARY PRINT OF OVERALL ACOUSTIC PROPERTIES OF JET.
C*  INITIALLY PRINT JET AND FREE STREAM CONDITIONS
C*
    1 XTREF=TREF
      XMUREF=MUREF
      IF(TREF.NE.0.) GO TO 3
      XSC=SC
      XTREF=BITS
      XMUREF=BITS
      XSC=BITS
C*
    3 WRITE(6,100)

      IF(.NOT. PAO)  GO TO 70
      MU1=MU+1
      GO TO (71,73,75), MU1

   70 IF(LILLEY)  GO TO 89
      IF(RIBNER)  GO TO 88
```

```
      IF(NEARFD .GT. 0)  GO TO 80
      IF(LIGHTH .EQ. 1)  GO TO 82
   81 WRITE(6,91)
   91 FORMAT(54X,25HLIGHTHILL FAR FIELD MODEL)
      GO TO 90
   82 WRITE(6,92)
   92 FORMAT(50X,34HSELF + SHEAR NOISE FAR FIELD MODEL)
      GO TO 90
   80 GO TO (83,84,85,86,87), NEARFD
   83 WRITE(6,93)
   93 FORMAT(48X,37HISOTROPIC TURBULENCE NEAR FIELD MODEL)
      GO TO 90
   84 WRITE(6,94)
   94 FORMAT(50X,34HLATERAL QUADRUPLE NEAR FIELD MODEL)
      GO TO 90
   85 WRITE(6,95)
   95 FORMAT(47X,39HLONGITUDINAL QUADRUPLE NEAR FIELD MODEL)
      GO TO 90
   86 WRITE(6,96)
   96 FORMAT(30X,73HCOMBINATION NEAR FIELD MODEL USING LATERAL QUADRUPLE
     X IN TRANSITION REGION)
      GO TO 90
   87 WRITE(6,97)
   97 FORMAT(29X,76HCOMBINATION NEAR FIELD MODEL USING ISOTROPIC TURBULE
     XNCE IN TRANSITION REGION)
      GO TO 90
   88 WRITE(6,98)
   98 FORMAT(56X,22HRIBNER FAR FIELD MODEL)
      GO TO 90
   89 WRITE(6,99)
   99 FORMAT(56X,22HLILLEY FAR FIELD MODEL)
      GO TO 90
   71 WRITE(6,72)
   72 FORMAT(48X,38HPAO SELF + SHEAR NOISE FAR FIELD MODEL)
      GO TO 90
   73 WRITE(6,74)
   74 FORMAT(52X,30HPAO SELF NOISE FAR FIELD MODEL)
      GO TO 90
   75 WRITE(6,76)
   76 FORMAT(52X,31HPAO SHEAR NOISE FAR FIELD MODEL)
   90 WRITE (6,108) NAME,ADDRES,TITLE,IDENT,IDENT1,
     * TE,DIAJ,GAM,PE,MJET,RG,
     * VE,TJET,PH,ME,PTJET,PRT,TIE,VJET,XSC,TIJET,
     * XTREF,XMUREF
C*
C*  PRINT FAR FIELD NOISE PARAMETERS
C*
    4 WRITE (6,109) PREFN,ASPEED,SLINE
      WRITE (6,110) (L,ANGJ(L),PSUM2(L),OASPL(L),PNDB(L),
     * (SPLOC(J,L),J=1,8),L=1,NA)
      GO TO 10
C*
C*  IF BAND3=.TRUE.    PRINT RESULTS OF 1/3 OCTAVE
C*  BAND FREQUENCY SPECTRUM ANALYSIS
C*
      ENTRY PBAND3
```

```
      NANG=NANG+1
      IF(NANG .GT. NA)  NANG=1
      ANG=ANGJ(NANG)/57.2958
      DIA=DIAJ/12.
      XCOR=SLINE/SIN(ANG)*COS(ANG)/DIA
      YCOR=SLINE/DIA
      RAD=SQRT(XCOR**2+YCOR**2)
      DO 25  I=1,36
   25 TSPL(I,NANG)=SPCTRM(I,5)
   30 CONTINUE
      WRITE(6,199) XCOR,YCOR,RAD,SLINE,ANGJ(NANG)
      IF(PAO)  WRITE(6,198)
  198 FORMAT(1H+,69X,6X,4HNPTS,5X,9HSPL  , DB ,6X,4HNPTS,5X,9HSPL  , DB /
     X  76X,4HSELF,7X,4HSELF,8X,5HSHEAR,7X,5HSHEAR)
      DO 250  I=1,36
      WRITE(6,200)  (SPCTRM(I,J),J=1,5)
  250 IF(PAO)  WRITE(6,201)  (SPCTRM(I,J),J=6,9)
  201 FORMAT(1H+,69X,I10,F14.4,I10,F14.4)
      CALL PRNPLT(SPCTRM(1,2),SPCTRM(1,5),36,80.,180.,PLTTIT)
   10 RETURN
C*
C*******************************  FORMAT STATEMENTS  ********************
C*
  100 FORMAT(1H1,40X,51H*      J E T   A N A L Y S I S   P R O G R A M
     *  *//,36X,61H*      S U M M A R Y   A C O U S T I C   A N A L Y S I
     * S      *///)
  108 FORMAT(30X,10A6/,30X,10A6/,30X,10A6/,30X,10A6/,30X,10A6///,
     * 52X,28H*  AERODYNAMIC PARAMETERS  *//,
     * 32X,19HEXTERNAL CONDITIONS,3X,24HJET DISCHARGE PARAMETERS,
     * 5X,14HGAS PROPERTIES//,32X,4HTE =,F14.3,6X,
     * 6HDIAJ =,F13.5,5X,6HGAM   =,F13.5/,32X,
     * 4HPE =,E14.4,6X,6HMJET =,F13.4,5X,
     * 6HRG    =,F13.5/,32X,4HVE =,F14.3,6X,6HTJET =,F13.3,
     * 5X,6HPR    =,F13.5/,32X,4HMF =,F14.4,6X,6HPTJET=,
     * E13.4,5X,6HPRT  =,F13.5/,32X,4HTIE=,E14.4,
     * 6X,6HVJET =,0PF13.3,5X,6HSC    =,F13.3/,56X,
     * 6HTIJET=,E13.4,5X,6HTREF =,F13.3/,80X,
     * 6HMUREF=,E13.4////)
  109 FORMAT(50X,32H*  FAR FIELD NOISE PARAMETERS  *//,
     * 45X,31HREFERENCE PRESSURE(PREFN)=       ,E16.8/,
     * 45X,31HAMBIENT SONIC VELOCITY(ASPEED)=,0PF16.2/,
     * 45X,31HSIDE-LINE DISTANCE (SLINE)=     ,F16.4//,
     * 2X,1HN,2X,10HANGLE,DEG.,4X,11HSOUND PRES.,5X,8HOASPL,DB,
     * 6X,8HPNDB, DB,25X,27HOCTAVE CENTER FREQ(HZ)-SPLS/
     * 63X,4H(63),4X,5H(125),4X,5H(250),4X,5H(500),3X,6H(1000),3X,
     * 6H(2000),3X,6H(4000),3X,6H(8000)/,61X,7H*******,2X,
     * 7H*******,2X,7H*******,2X,7H*******,2X,7H*******,2X,
     * 7H*******,2X,7H*******,2X,7H*******,//)
  110 FORMAT(1X,I2,F11.5,E17.6,F12.4,F14.4,F11.3,7F9.3)
  199 FORMAT(1H1,24X,24H1/3 OCTAVE BAND ANALYSIS/////,
     X  5X,6HX/D = ,F8.3,3X,6HY/D = ,F8.3,3X,6HR/D = ,F8.3/
     * 5X,18HSIDELINE DISTANCE=,F18.2,16X,6HANGLE=,F8.2//,
     * 3X,13HLOWER FREQ,HZ,3X,14HCENTER FREQ,HZ,2X,13HUPPER FREQ,HZ,
     * 3X,4HNPTS,5X,8HSPL  , DB)
  200 FORMAT(F13.1,F16.1,F16.1,I10,F14.4)
C*
```

```
C*  ENTRY  NOISP(XS)--- PRINT PROFILES OF PIJ,SPLIJ,FREQIJ AT
C*   A DISTANCE R FROM THE SOURCE
C*
      ENTRY NOISP
      KPOW  = 1
      IF( APOWER ) KPOW=2
C*
  300 WRITE (6,400)
      NSTART=1
      NLINES=NPD
      IF(NLINES.GT.50) NLINES=50
      NL=NLINES
      GO TO (306,3066),KPOW
  306 WRITE (6,410) XS,SLINE,ANGLE
      IF(PAO)  WRITE(6,412)
  412 FORMAT(1H+,70X,7X,3HPIJ,7X,8HSPLIJ,DB,5X,9HFREQIJ,HZ/
     X  37X,4HSELF,9X,4HSELF,9X,4HSELF,10X,5HSHEAR,8X,5HSHEAR,8X,5HSHEAR
     X)
      GO TO 3067
 3066 WRITE (6,411) XS,SLINE,ANGLE
 3067 NEND=NL
      ASSIGN 360 TO LG01
 3070 GO TO (307,3077),KPOW
  307 DO 310  L=NSTART,NEND
      WRITE(6,420)  L,Y(L),R(L),PIJ(L),SPLIJ(L),FREQIJ(L)
  310 IF(PAO)  WRITE(6,422)  PIJ2(L),SPLIJ2(L),FRQIJ2(L)
  422 FORMAT(1H+,69X,E15.4,E12.4,F12.2)
      GO TO 3078
 3077 WRITE (6,421) (L,Y(L),R(L),PIJ(L),SPLIJ(L),
     * FREQIJ(L),SPOW(L),L=NSTART,NEND)
 3078 GO TO LG01,  (360,390)
C*
  360 IF(NPD.LE.50) GO TO 390
      WRITE (6,400)
      GO TO (361,362),KPOW
  361 WRITE (6,410) XS,SLINE,ANGLE
      IF(PAO)  WRITE(6,412)
      GO TO 363
  362 WRITE (6,411) XS,SLINE,ANGLE
  363 NRMN=NPD-NL
      IF(NRMN.GT. 50) GO TO 365
      NSTART=NEND+1
      NEXT=MIN0(50,NRMN)
      NL=NL+NEXT
      ASSIGN 390 TO LG01
      NEND=NL
      GO TO 3070
  365 NSTART=NEND+1
      NEND=NL+50
      NL=NL+50
      GO TO 3070
  390 RETURN
C*
C***************************  FORMAT STATEMENTS  *************************
C*
  400 FORMAT(1H1,35X,28H*  JET  ANALYSIS  PROGRAM  *//)
```

```
  410 FORMAT(21X,18HACOUSTIC PROFILES-,17X,2HX=,F10.5//,
     * 5X,18HSIDELINE DISTANCE=,F8.2,15X,6HANGLE=,F8.2//,
     * 3X,1HN,9X,1HY,10X,5HR,FT.,9X,3HPIJ,7X,8HSPLIJ,DB,
     * 5X,9HFREQIJ,HZ)
  420 FORMAT(I5,E14.4,F11.2,E15.4,E12.4,F12.2)
  411 FORMAT(21X,18HACOUSTIC PROFILES-,17X,2HX=,F10.5//,
     * 5X,18HSIDELINE DISTANCE=,F8.2,16X,6HANGLE=,F8.2//,
     * 3X,1HN,9X,1HY,10X,5HR,FT.,9X,3HPIJ,7X,8HSPLIJ,DB,
     * 5X,9HFREQIJ,HZ,2X,16HPOWER (PWL) , DB//)
  421 FORMAT(I5,E14.4,F11.2,E15.4,E12.4,F12.2,
     * F16.6)
C*
C***  ENTRY TO PRINT ACOUSTIC POWER ANALYSIS
C*
      ENTRY  PWPRNT
      WRITE (6,610) POWTOT
C*
C*  PRINT STATION POWER LEVELS
C*
      WRITE (6,611) (X(L),POW(L),L=1,NXTA)
C*
C*  PRINT 1/3-OCTAVE POWER LEVELS
C*
      WRITE (6,612)
      WRITE (6,613) ((SPCTRM(I,J),J=1,3),INP(I),POW3(I),
     * I=1,36)
C*
C****  FORMAT  STATEMENTS
  610 FORMAT(1H1,19X,38H**    S U M M A R Y      A C O U S T I C,
     * 5X,35HP O W E R      A N A L Y S I S     **//,35X,
     *35HTOTAL ACOUSTIC POWER OUTPUT OF JET=,  F15.6,1X,8H(PWL),DB///,
     *43X,34HPOWER OUTPUT PER JET RADIUS LENGTH//7X,1HX,12X,
     *5HPOWER,12X,1HX,12X,5HPOWER,12X,1HX,12X,5HPOWER,12X,1HX,12X,
     15HPOWER)
  611 FORMAT(F11.5,F16.6,F14.5,F16.6,F14.5,F16.6,F14.5,F16.6)
  612 FORMAT(//45X,30H1/3-OCTAVE BAND POWER SPECTRUM//,
     *23X,13HLOWER FREQ,HZ,3X,14HCENTER FREQ,HZ,
     * 2X,13HUPPER FREQ,HZ,3X,4HNPTS,5X,5HPOWER/)
  613 FORMAT(20X,F13.1,2F16.1,I10,F13.6)
      RETURN
      END
```

```
*DECK OCTAV3
COCTAV3          1/3 OCTAVE BAND ANALYSIS
      SUBROUTINE OCTAV3(NP,ENTRY1)
      LOGICAL  PAO
      LOGICAL ENTRY1
      COMMON/NOISE2/PIJ(200),SPLIJ(200),FREQIJ(200),PIJ2(200),
     X  SPLIJ2(200),FRQIJ2(200)
      COMMON/NOISE3/FL(36),FC(36),FU(36),IN(36),SP(36),IN1(36),SP1(36),
     X  IN2(36),SP2(36)
      COMMON/NOISE7/DUMMY(7),PAO
      COMMON /NOISE5/ PNDB(20)   ,   SPLOC(8,20)
      COMMON /NOISE8/APOWER,POW(100),POWTOT,SPOW(200)
      LOGICAL APOWER
      COMMON /NOISE9/INP(36),POW3(36)
      COMMON /CENTRY/ NA1,XS,ANGJJ
      REAL LTAB(22,6), MTAB(22,4)
      REAL  NOYS,NOYSUM,NOYSM,NOYBAR
      DIMENSION FREQ(30)
      DIMENSION QTAB(132),  RTAB(88)
      EQUIVALENCE (LTAB(1),QTAB(1)),(MTAB(1),RTAB(1))
      DATA FREQ/
     * 11.2,14.1,17.8,22.4,28.2,35.5,44.7,56.3,70.9,89.2,
     * 12.5,16.,20.,25.,31.5,40.,50.,63.,80.,100.,
     * 14.1,17.8,22.4,28.2,35.5,44.7,56.3,70.9,89.2,112./
C*
    1 IF(.NOT.  ENTRY1) GO TO 10
C*
C*  INITIALIZE ARRAYS
C*
    2 ENTRY1=.FALSE.
      CALL SETM(1,0,IN,36)
      CALL SETM(1,0.,SP,36)
      CALL SETM(1,0,IN1,36)
      CALL SETM(1,0,IN2,36)
      CALL SETM(1,0.,SP1,36)
      CALL SETM(1,0.,SP2,36)
      IF(.NOT. APOWER) GO TO 611
      CALL SETM(1,0,INP,36)
      CALL SETM(1,0.,POW3,36)
  611 CON=1.
      J=1
      DO 3 L=1,36
      IF(L.EQ.11 .OR. L.EQ.21 .OR. L.EQ.31) GO TO 33
      GO TO 35
   33 J=1
      CON=10.*CON
   35 FL(L)=CON*FREQ(J)
      FC(L)=CON*FREQ(J+10)
      FU(L)=CON*FREQ(J+20)
      J=J+1
    3 CONTINUE
C*
C*
* SCAN FREQUENCIES -- SUM SOUND PRESSURES
   10 DO 100  L=1,NP
      F=FREQIJ(L)
```

```
      IF(F .LT. FL(1)  .OR.  F .GT. FU(36))  GO TO 40
      DO 25  J=1,36
      IF(FL(J) .GT. F)  GO TO 30
   25 CONTINUE
      J=J+1
   30 IN(J-1)=IN(J-1)+1
      SP(J-1)=SP(J-1)+PIJ(L)
      IF(.NOT. PAO)  GO TO 37
      IN1(J-1)=IN1(J-1)+1
      SP1(J-1)=SP1(J-1)+PIJ(L)
   37 IF(.NOT. APOWER)  GO TO 40
      INP(J-1)=INP(J-1)+1
      POW3(J-1)=POW3(J-1)+SPOW(L)
   40 IF(.NOT. PAO)  GO TO 100
      F=FRQIJ2(L)
      IF(F .LT. FL(1)  .OR.  F .GT. FU(36))  GO TO 100
      DO 50  J=1,36
      IF(FL(J) .GT. F)  GO TO 60
   50 CONTINUE
      J=J+1
   60 IN2(J-1)=IN2(J-1)+1
      SP2(J-1)=SP2(J-1)+PIJ2(L)
      IN(J-1)=IN(J-1)+1
      SP(J-1)=SP(J-1)+PIJ2(L)
  100 CONTINUE
      RETURN
C*
C*  COMPUTE OCTAVE SOUND PRESSURE LEVELS
C*  START AT 63  HZ
C*
      ENTRY OCTAV
      LT=7
      LT1=LT+2
      DO 400 L=1,8
      PSUMO=0.
      DO 401 K=LT,LT1
  401 PSUMO=PSUMO + SP(K)
      SPLOC(L,NA1)=PSUMO
      LT=LT+3
      LT1=LT1+3
  400 CONTINUE
C*
  410 RETURN
C*
C*  ENTRY PNDBC-- PERCEIVED NOISE CALCULATION  (PNDB)
C*
      ENTRY PNDBC
      DATA QTAB/
     * 44.,39.,34.,30.,27.,24.,21.,18.,5*16.,
     * 15.,12.,9.,5.,4.,5.,6.,10.,21.,
     * 51.,46.,42.,39.,36.,33.,30.,27.5,5*25.,
     * 23.,21.,18.,15.,2*14.,15.,17.,23.,
     * 60.,56.,53.,51.,48.,46.,44.,42.,5*40.,
     * 38.,34.,32.,30.,2*29.,30.,31.,37.,
     * 85.88,87.32,79.85,79.76,75.96,73.96,74.91,
     * 94.63,13*100.,44.29,
```

```
      * 22*150.,
      * 51.,49.,47.,46.,45.,43.,42.,41.,5*40.,
      * 38.,34.,32.,30.,2*29.,30.,31.,34./
       DATA RTAB/
      * 2*.06816,.05964,10*.053013,.05964,2*.053013,
      * 2*.047712,2*.053013,.06816,.07952,
      * .058098,.052288,.047534,2*.043573,.040221,
      * .037349,7*.034859,.040221,.037349,4*.034859,2*.037349,
      * .04057,2*.036831,.035336,2*.033333,
      * .032051,.030675,6*.030103,7*.02996,.042285,
      * 14*.030103,8*.02996/
C*
C*     CALCULATE NOYS VALUES
C*
       NOYSUM=0.
       NOYSM =0.
       LB=7
       DO 200 L=1,22
       LB=LB+1
       SPL1=SP(LB)
C*
C*  LOCATE SPL1 POSITION IN TABLES
C*
       DO 201 K=1,5
       IF(LTAB(L,K).GT.SPL1) GO TO 202
  201  CONTINUE
  202  IF(K.NE.1)  XM=MTAB(L,K-1)
       GO TO (210,211,212,213,214)  ,  K
  210  NOYS=0.
       GO TO 220
  211  NOYS=.1*10.**(XM*(SPL1-LTAB(L,K-1)))
       GO TO 220
  212  NOYS=10.**(XM*(SPL1-LTAB(L,K)))
       GO TO 220
  213  NOYS=10.**(XM*(SPL1-LTAB(L,K-1)))
       GO TO 220
  214  K=K+1
       GO TO 212
C*
C*  COMPUTE NOYSUM,NOYSM
C*
  220  NOYSM=AMAX1(NOYSM,NOYS)
  200  NOYSUM=NOYSUM+NOYS
C*
C*  COMPUTE PERCEIVED NOISE LEVEL  (PNDB)
C*
  230  NOYBAR=0.85*NOYSM+  .15*NOYSUM
       IF(NOYBAR.GT..0625) GO TO 240
       PNDB(NA1)=0.0
       RETURN
  240  PNDB(NA1)=40. + 33.22*ALOG10(NOYBAR)
       RETURN
C*
       END
```

```
*DECK PRNPLT
      SUBROUTINE PRNPLT(X,Y,NPTS,YMIN,YMAX,HOL)
CPRNPLT
C            PRINTER-PLOTTER ROUTINE
C
C            ARGUMENTS
C
C              X          - INDEPENDENT VARIABLE ARRAY. DATA IS ASSUMED
C                           TO BE INCREASING AND EQUALLY SPACED.
C              Y          - DEPENDENT VARIABLE ARRAY. ONE-TO-ONE
C                           CORRESPONDENCE TO X ARRAY.
C              NPTS       - NUMBER OF DATA POINTS ((X,Y) PAIRS).
C              YMIN,YMAX  - LOWER AND UPPER BOUNDS FOR DEPENDENT
C                           VARIABLE SCALE. DATA WILL BE SCALED
C                           INTERNALLY IF BOTH ARE SET TO ZERO.
C              HOL        - 12 WORD HOLLERITH ARRAY. WORDS 1-10, PLOT
C                           TITLE. WORD 11, DEPENDENT VARIABLE AXIS LABEL.
C                           WORD 12, INDEPENDENT VARIABLE AXIS LABEL.
C
      DIMENSION X(1),Y(1),HOL(12),MODS(101),NMODS(101),FRMARY(104),
     1 YLAB(6)
      INTEGER FRMARY
      DATA (MODS(I),I=1,101)/3H1H+,9*3H1H-,3H1H+,9*3H1H-,3H1H+,9*3H1H-,
     1  3H1H+,9*3H1H-,3H1H+,9*3H1H-,3H1H+,9*3H1H-,3H1H+,9*3H1H-,
     2  3H1H+,9*3H1H-,3H1H+,9*3H1H-,3H1H+,9*3H1H-,3H1H+/
      DATA (NMODS(I),I=1,101)/3H1HI,9*3H1H ,3H1HI,9*3H1H ,3H1HI,9*3H1H ,
     1  3H1HI,9*3H1H ,3H1HI,9*3H1H ,3H1HI,9*3H1H ,3H1HI,9*3H1H ,
     2  3H1HI,9*3H1H ,3H1HI,9*3H1H ,3H1HI,9*3H1H ,3H1HI/
      DATA (FRMARY(I),I=1,2)/6H(1H E1,6H2.5,1X/,FRMARY(104)/1H)/
      DATA ISYMB/3H1HX/
C
      WRITE (6,900) (HOL(I),I=1,6)
  900 FORMAT(1H1,28X,6A10//)
C
      IF(YMIN.EQ.0.0.AND.YMAX.EQ.0.0) GO TO 5
      YMN = YMIN
      YMX = YMAX
      GO TO 15
    5 YMN = Y(1)
      YMX = Y(1)
      DO 10 I=2,NPTS
      YMN = AMIN1(YMN,Y(I))
   10 YMX = AMAX1(YMX,Y(I))
      WRITE(6,901) YMN,YMX
  901 FORMAT(62X,5HRANGE/51X,E12.5,4H TO ,E12.5//)
      DELTA = 0.05*ABS(YMX-YMN)
      YMN = YMN-DELTA
      YMX = YMX+DELTA
   15 DELTAY = (YMX-YMN)/100.
      DELTY2 = DELTAY/2.
C
      DO 20 I=1,6
   20 YLAB(I) = YMN+FLOAT(I-1)*20.*DELTAY
      WRITE(6,902) HOL(11),(YLAB(I),I=1,6),HOL(12)
  902 FORMAT(1X,A6,1X,E12.5,5(8X,E12.5)/1X,A6,7X,1HI,5(19X,1HI))
C
```

```
      DO 55 I=1,NPTS
      IF(MOD(I-1,5).EQ.0) GO TO 30
      DO 25 IFR=3,103
   25 FRMARY(IFR) = NMODS(IFR-2)
      GO TO 40
   30 DO 35 IFR=3,103
   35 FRMARY(IFR) = MODS(IFR-2)
   40 YG = YMN-DELTAY
      DO 45 IY=1,101
      YG = YG+DELTAY
      YGPD2 = YG+DELTY2
      IF(.NOT.(ABS(Y(I)-YG).LT.DELTY2.OR.Y(I).EQ.YGPD2)) GO TO 45
      FRMARY(IY+2) = ISYMB
      GO TO 50
   45 CONTINUE
   50 WRITE(6,FRMARY) X(I)
   55 CONTINUE
      RETURN
      END
```

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